EPA WORK ASSIGNMENT NO: 076-2JZZ
EPA CONTRACT NO: 68-W8-0110
FOSTER WHEELER ENVIRONMENTAL CORPORATION
ARCS II PROGRAM

FINAL
SITE INSPECTION PRIORITIZATION (SIP)
LETTER REPORT
NORTON LABS SITE
CITY OF LOCKPORT
NIAGARA COUNTY, NEW YORK
CERCLIS NO. NYD002105344

AUGUST 1995

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Norton Labs Site
520 Mill Street
Lockport, Niagara County, New York
CERCLIS No. ~~NYD002105344~~ NYD 030212799

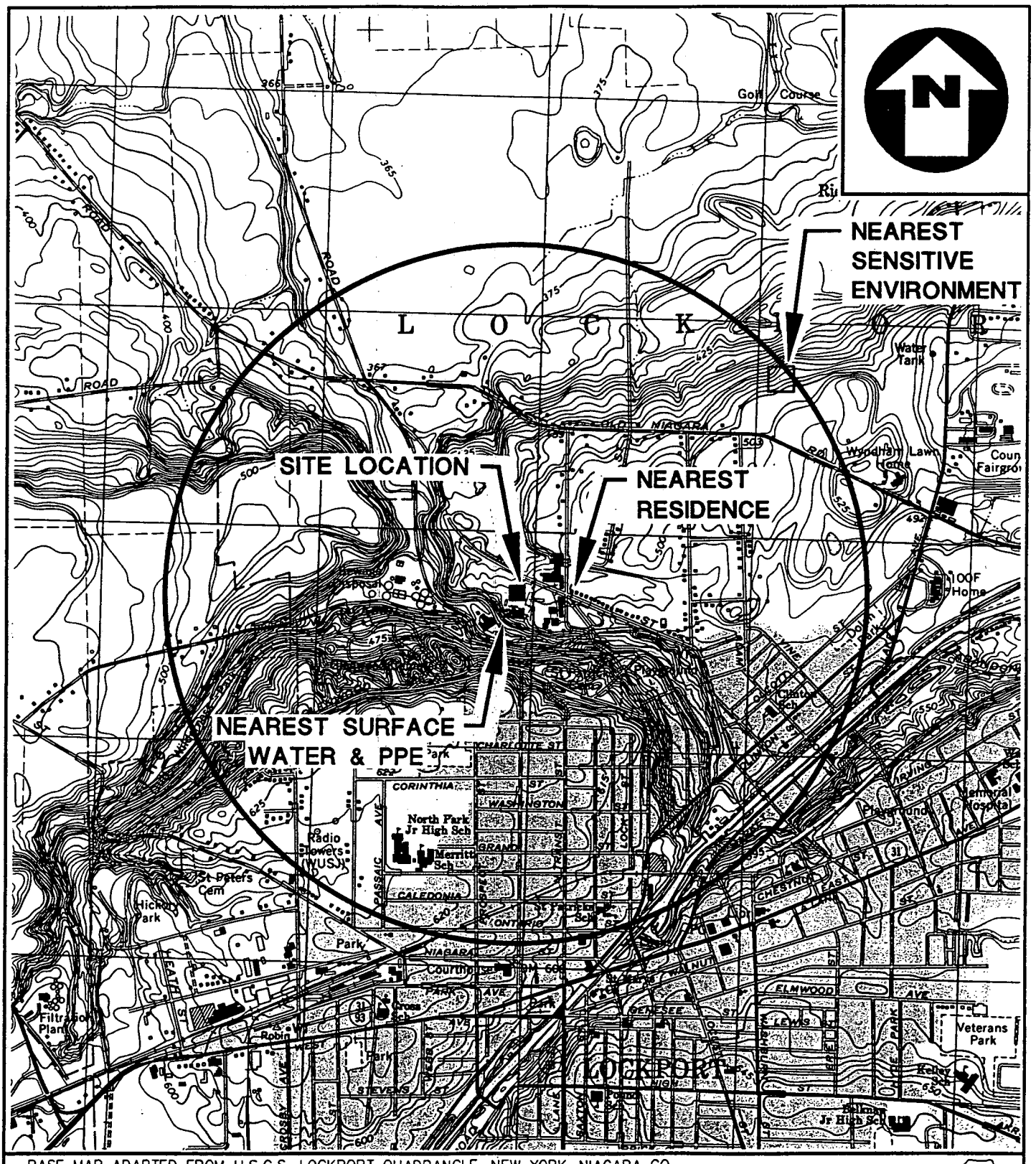
Documents Reviewed

United States Environmental Protection Agency (USEPA) files and the New York State Department of Environmental Conservation (NYSDEC) State and Region 9 files related to the Norton Labs site were reviewed for preparation of this Site Inspection Prioritization (SIP) report. This included the Preliminary Investigation of the Norton Labs Site, Phase I Summary Report, the Engineering Investigations at Inactive Hazardous Waste Sites, Phase II Investigation report and summaries of prior investigations included in these documents. Additional information and data collected included: the CENTRACTS report of populations and private well usage within a 4-mile radius of the site, wetlands data from the U.S. Department of the Interior National Wetlands Inventory Map, and sensitive environments data from the Biological and Conversation Data System of the NYSDEC National Heritage Program. A site reconnaissance was also conducted. A field notebook for documentation and a photolog were prepared as part of the site reconnaissance.

Site Description and History

The Norton Labs site, located at 520 Mill Street, Lockport, New York, is situated on a bluff approximately 100 feet above Eighteenmile Creek (Ref. 3, p. 3 of 8). Figure 1 shows the site location and Figure 2 is a sketch of the 2 to 3 acre site (Ref. 4, p. 4 of 8), including the location of previously installed monitoring wells. Norton Landfill is located in the northwestern corner of the site. Steep slopes are formed by a bluff to the south of the site and a railway roadcut to the west (Ref. 3, p. 3 of 8). The railway runs between the Norton Labs Landfill to the east and the Van De Mark Landfill to the west (Ref. 5, p. 5 of 12). The McGonigle-Hilgar Landfill overlies the east-southeast corner (approximately 0.4 acre) of the Norton Landfill (Ref. 4, p. 4 of 8).

During its operation from 1965 to 1976, Norton Laboratories, Inc. disposed of over 2,000 tons of solid phenolic/polyester based plastic waste (Ref. 3, p. 2 of 8) in an on-site landfill (Ref. 6, p. 1 of 1). At least 3,000 gallons of waste lubricating/hydraulic oil were poured onto the land surface at the plant site (Ref. 3, p. 2 of 8). No specific area was designated for oil disposal and Norton Labs used different buildings, so an exact location of the oil disposal is unknown (Ref.



BASE MAP ADAPTED FROM U.S.G.S. LOCKPORT QUADRANGLE, NEW YORK–NIAGARA CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

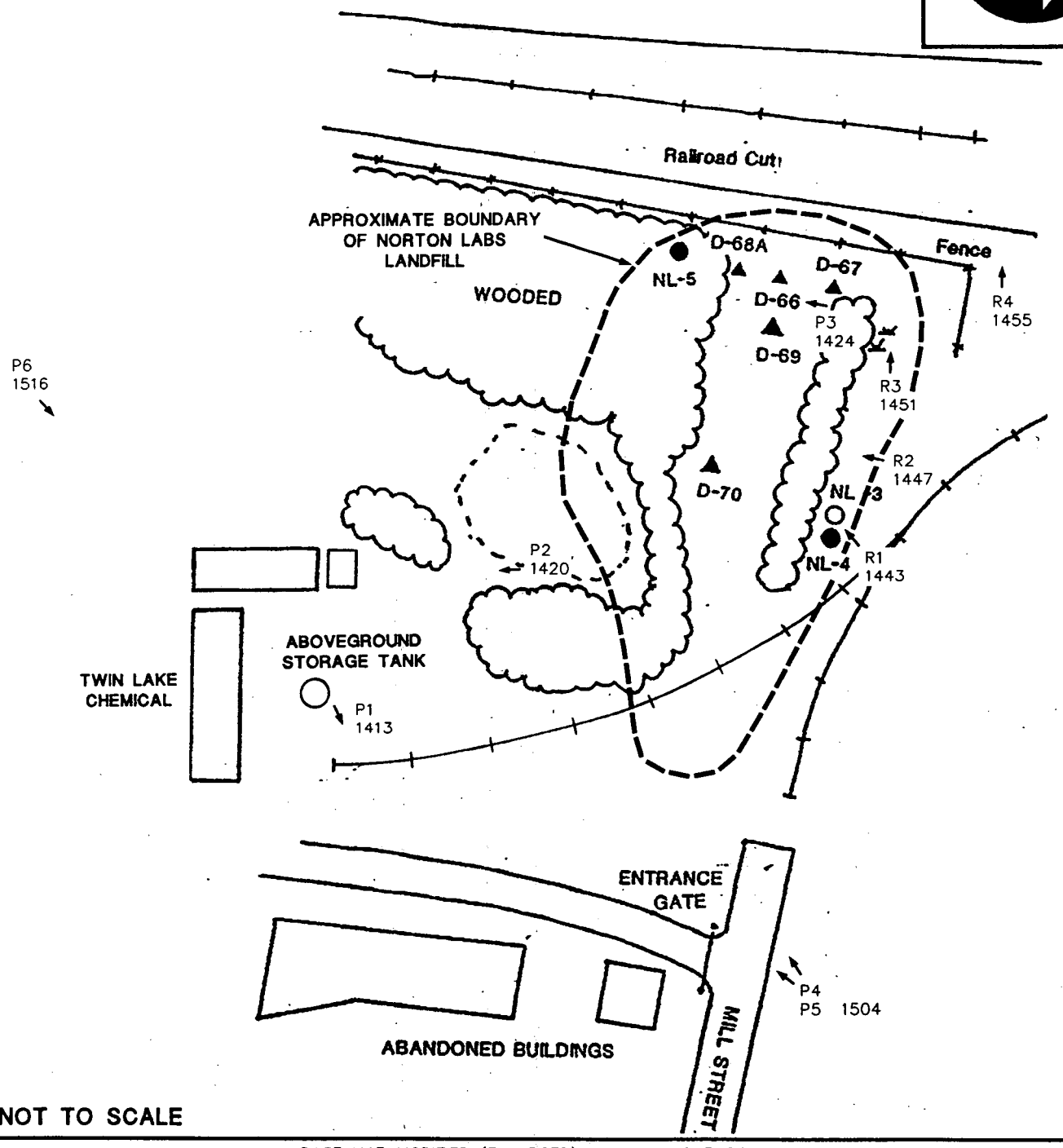
QUADRANGLE LOCATION

SITE LOCATION MAP

NORTON LABS SITE
LOCKPORT, NEW YORK

EBASCO ENVIRONMENTAL

FIGURE 1



BASE MAP MODIFIED (ENLARGED) FROM 16 NOVEMBER 1982 AERIAL PHOTOGRAPH

KEY:

- ○ DEEP MONITORING WELL
- ● SHALLOW MONITORING WELL
- ▲ SOMERSET R.R. MONITORING WELL
- ← PHOTOGRAPH LOCATION, INDICATING DIRECTION OF PHOTO. R=35 mm CAMERA. P=DISPOSAL PANORAMIC BOX CAMERA.

MAP LOCATION

SITE SKETCH MAP

NORTON LABS SITE
LOCKPORT, NEW YORK

EBASCO ENVIRONMENTAL

FIGURE 2

7, p. 2 of 2). The Norton Labs Landfill closed in 1976 (Ref. 3, p. 2 of 8). The McGonigle-Hilgar Landfill was used from 1978 to 1982 by the McGonigle & Hilgar Roofing Company and contains roofing and construction debris (Ref. 4, p. 4 of 8).

The site is currently owned by the Twin Lake Chemical Company, with a facility on site producing phosgene and organic chloride acids. The company employs 15 people (Ref. 8, p. 1 of 3). Two buildings along the eastern site boundary are used for equipment storage (Ref. 9, p. 1 of 1). The railroad and right-of-way along the western boundary of the site are owned by Somerset Railroad Corporation, a subsidiary of New York State Electric and Gas (Ref. 10, p. 1 of 1).

In August 1982, Somerset Railroad Corporation constructed the railway to the west of the Norton Labs site, which included excavation for a roadcut which borders the landfill area. In 1981, Bechtel Civil & Minerals conducted a hydrogeologic study of the proposed railway route (Danielewicz Route) to determine groundwater flow direction relative to the proposed cut and evaluate water quality in the area (Ref. 5, p. 3 of 12). As part of this study, 22 monitoring wells were installed; two (D-69 & D-70) were screened in the uppermost saturated zone (Zone 1) and six (D-53, D-55, D-58, D-61, D-64, D-66) in the second saturated zone (Zone 2) (Ref. 5, pp. 7 through 8 of 12). Zone 1 is found at the contact of fill material and the underlying sandstone in the Norton Labs landfill area and Zone 2 at the contact of the Grimsby Formation and the Power Glen (Ref. 5, p. 2 of 12). The other wells were screened in deeper aquifers or located in areas not relevant to the Norton Labs site Formation (Ref. 4, p. 6 of 8; Ref. 5, pp. 7 through 8 of 12). Groundwater levels in these wells indicated that groundwater flow was generally from east to west (Ref. 5, p. 2 of 12).

Two rounds of groundwater sampling in these wells were performed by RECRA Research, Inc. in November of 1981 (Ref. 5, pp. 5 through 6 of 12). Using analyses of samples taken in the second round (after well purging), no releases of contaminants to groundwater were observed in either Zone 1 or Zone 2 (Ref. 5, pp. 9 through 10 of 12).

Woodward-Clyde Consultants, Inc. also performed an investigation of the proposed roadcut for Somerset Railroad. On November 15, 1981, groundwater samples were collected from the monitoring wells installed by Bechtel and a surface water sample was collected from Eighteenmile Creek, at the approximate location where the proposed railway centerline would intersect the creek (Ref. 11, p. 3 of 5). Analysis of these samples by Advanced Environmental Systems, Inc. indicated that the barium concentration in well D-66 (located in the Norton Labs

landfill area) was three times greater than the barium concentration in well D-53 (used as background) (Ref. 11, p. 4 of 5). In the stream sample, only barium (0.20 mg/l) and zinc (0.035 mg/l) were detected in amounts that exceeded detectable concentrations (Ref. 11, p. 4 of 5). The report concluded that "water in the landfill materials currently is effectively isolated from the groundwater within the bedrock" (Ref. 11, p. 5 of 5). The wells were again sampled on April 27, 1982. Analysis of these samples indicated the arsenic concentration (0.014 mg/l) in well D-66 was slightly above the detection limit of 0.01 mg/l; arsenic was not detected in background well D-53 (Ref. 12, pp. 2 and 3 of 3).

During excavation of the Somerset Railroad roadcut in August 1982, two drums were exposed and at least one was punctured, releasing a green, oily liquid (Ref. 3, p. 2 of 8). Subsequent EP Toxicity analysis of the material indicated the presence of lead (0.097 mg/l) and barium (5.2 mg/l). These levels are below TCLP limits for hazardous waste. Analysis of the liquid also indicated the presence of phenol (175 mg/l) (Ref. 13, pp. 1 through 2 of 2). Analysis of the surrounding soil indicated 6.5 mg/kg of PCBs (Ref. 14, p. 1 of 3). The two drums and 15 cubic yards of surrounding soil were removed to the SCA Services Model City Landfill (Ref. 14, pp. 1 through 3 of 3).

Federal/State Records

The Preliminary Investigation of the Norton Labs site, Phase I Investigation, was released in September 1984 and was performed for NYSDEC by Ecological Analysts, Inc. Site topography, geology, hydrogeology and past activities and investigations were discussed. A summary of past sampling and analyses was presented (Ref. 3, pp. 3 through 5 of 8) and additional sampling was recommended, with analyses expanded to include acid phenolics and base neutral compounds (Ref. 3, p. 7 of 8). A work plan for Phase II Investigation, including costs, was outlined (Ref. 3, pp. 7 through 8 of 8).

The Engineering Investigations at Inactive Hazardous Waste Sites, Phase II Investigation of the Norton Labs site was performed for NYSDEC in April 1988 by EA Science and Technology, Inc. During site reconnaissance activities, upgradient and site-wide HNu measurements indicated no organic vapors exceeding background levels (Ref. 4, p. 3 of 8). Five monitoring wells (three shallow and two deep) were installed including two upgradient wells (one shallow and one deep) on the east perimeter of the landfill (Ref. 4, p. 2 of 8). Samples collected on April 3, 1986 indicated downgradient concentrations (well NL-W3) of acetone and copper that were three times greater than the upgradient concentrations (well NL-W1) in the lower saturated zone. The concentrations were (upgradient, downgradient respectively): acetone - below contract required

detection limit, 490 mg/l; and copper - 0.04 mg/l, 0.2 mg/l. However, acetone was detected in the trip blank (Ref. 4, pp. 5 and 7 through 8 of 8). Samples from shallow wells indicated the iron concentration in downgradient well NL-W4 (9.80 mg/l) was three times greater than the iron concentration in upgradient well NL-W2 (0.42 mg/l) (Ref. 4, pp. 7 through 8 of 8). No surface water or soil samples were collected.

A site visit to the Norton Labs site on January 18, 1995 included a tour of the site, preparation of a field notebook, and preparation of a photolog indicating current site conditions. No visible soil discoloration or stressed vegetation was observed; the only wastes evident apparently the result of construction activities (Ref. 8, p. 2 through 3 of 3).

Hazard Assessment

Additional data collected to further evaluate the site in determining the need for CERCLA remediation included: the CENTRACTS report of populations and private well usage within a 4-mile radius of the site, wetlands data from the U.S. Department of the Interior National Wetlands Inventory Map, and sensitive environments data from the Biological and Conservation Data System of the NYSDEC National Heritage Program.

Groundwater Pathway

Two zones of groundwater are potentially impacted by the landfill (Ref. 3, p. 3 of 8). Since formations underlying the study area have very little primary permeability, the occurrence and movement of groundwater is in fractures and joints in the rocks (Ref. 5, p. 4 of 12). The uppermost aquifer, Zone 1, occurs at the contact between the fill material and the upper Grimsby Formation, and is limited in areal extent to the Norton Labs landfill area (Ref. 11, p. 2 of 5). Zone 2 occurs at the contact of the lower Grimsby and Power Glen Formations (Ref. 3, p. 3 of 8) and is the aquifer of concern. Well report sheets from October 28, 1981 indicate the groundwater elevation in Zone 1 is 458.6 feet and the groundwater elevation in Zone 2 is 438.8 feet (Ref. 5, pp. 11 through 12 of 12).

Groundwater is not widely used as a drinking water source in Lockport (Ref. 15, pp. 2 through 4 of 4). The majority of Lockport uses public drinking water from a Niagara River source located outside the 4-mile TDL (Ref. 16, pp. 2 through 4 of 4), but available information indicates that 264 people use private wells within four miles of the Norton Labs site. This population is distributed as follows: 0 to 0.25 mile, 7; 0.25 to 0.5 mile, 15; 0.5 to 1 mile, 15; 1 to 2 miles, 38; 2 to 3 miles, 83; and 3 to 4 miles, 107 (Ref. 16, pp. 3 through 4 of 4). No municipal wells are located in the Lockport area (Ref. 15, p. 2 of 4).

Surface Water Pathway

The nearest surface water body to the site is Eighteenmile Creek, located approximately 500 feet south of the site. Eighteenmile Creek flows along the base of the Niagara Escarpment, about 100 feet below the elevation of the Norton Labs site (Ref. 3, p. 3 of 8). All site runoff eventually drains to Eighteenmile Creek, either directly, via the railroad cut, or via ditches which parallel Mill Street (Ref. 3, p. 3 of 8). The ditches paralleling Mill Street drain into a storm sewer which drains to Eighteenmile Creek (Ref. 8, p. 3 of 3). A nearby wastewater treatment plant that discharges to the creek is required to maintain the flow rate of Eighteenmile Creek at 40 cubic feet per second (cfs) at this discharge location (Ref. 17, p. 1 of 1).

In addition to the wastewater treatment plant, Eighteenmile Creek receives discharge from several industries in the Lockport area and from the city storm sewer system (Ref. 18, p. 1 of 1). The creek is used for fishing and recreation but there is a restriction on eating any fish from the creek (Ref. 19, p. 2 of 2). No drinking water intakes are located along Eighteenmile Creek (Ref. 15, p. 2 of 4). The Norton Labs site is not located in a floodplain (Ref. 20, pp. 2-3 of 3). The 2-year, 24-hour rainfall for Niagara County is 2.3 inches (Ref. 21, pp. 2 through 3 of 3).

Soil Exposure Pathway

There is no documentation of hazardous material disposal at the Norton Labs site, nor can PCB-contaminated soil exposed during railroad construction be attributed to the Norton Landfill. There are no day-care facilities or schools within 200 feet of the Norton Labs site. Twin Lake Chemical Company, with a workforce of 15 people, currently occupies the Norton Labs Complex and is located approximately 150 feet from the landfill (Ref. 8, p. 1 of 3). The site is accessible to the public, but has no apparent recreational uses (Ref. 8, pp. 2 through 3 of 3).

Air Pathway

During Phase II investigation site reconnaissance activities, upgradient and site-wide HNu measurements indicated no organic vapors that exceeded background levels (Ref. 4, p. 3 of 8). No observed releases are documented at the site and no contaminants are exposed which might release to the air pathway.

Conclusions

- There is no documentation of hazardous waste disposal at the Norton Labs site and there is no evidence of contamination on site.

- The original location of drums and contaminated soil exposed during construction of the Somerset Railroad is unknown, so attribution of related contaminants to the Norton Labs site is not possible.

- Attribution of chemical constituents detected in past groundwater sampling to the Norton Labs site would be difficult, due to the lack of documentation of materials disposed of in the landfill and naturally high levels of many of these constituents in the area.

- Surface water from the site drains into Eighteenmile Creek. Numerous other industries, the Lockport stormwater drainage system, and the wastewater treatment plant also discharge to the creek, so attribution of contamination in the creek to the Norton Labs site would be difficult, if not impossible.

- Drums and contaminated soil exposed during construction of the Somerset Railroad were removed to a secured landfill in a timely manner. The location of the drums and soil upon exposure is unknown and analysis showed that the drums contained no hazardous wastes.

- No schools, day-care facilities, residences, or sensitive environments are located on or within 200 feet of the site. Fifteen workers are located approximately 150 feet from the Norton Labs landfill, but there is no evidence of soil contamination.

- Lockport uses a public water supply with a source in the Niagara River, although 264 people use private wells within four miles of the Norton Labs site.

Recommendations

A review of existing documents and information collected for the SIP report, indicates no documentation of hazardous waste disposal at the Norton Labs Landfill site nor evidence of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) eligible contamination at the site. On this basis, a finding of No Further Remedial Action Planned (NFRAP) is recommended for this site.

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Reviewed by:

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4. EA Science and Technology, Engineering Investigations at Inactive Hazardous Waste Sites, Phase II Investigation, Norton Labs, Site No. 932029, Town of Lockport, Niagara County, prepared for New York State Department of Environmental Conservation, April 1988.

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12. Advanced Environmental Systems, Inc., Analysis of Nine Groundwater Samples, June 1, 1982.

13. RECRA Research, Inc., Waste Characterization performed for Somerset Railroad, November 9, 1982.

REFERENCES (Cont'd)

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18. Powell, L. Telephone conversation with Dr. Simon Litton, New York State Department of Environmental Conservation, Division of Water, RE: uses/samples/analytical data per Eighteenmile Creek, Lockport, New York, February 1, 1995.

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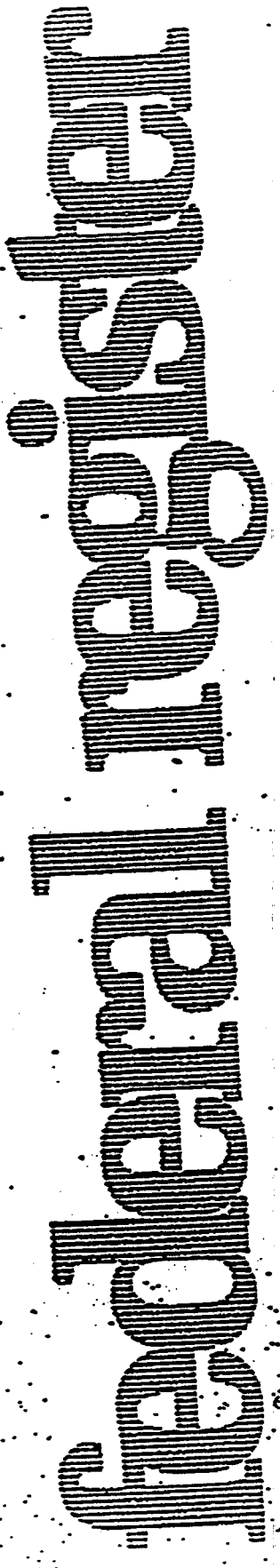
21. Wilks, D.S. and Cember, R.P., Atlas of Precipitation Extremes for the Northeastern United States and Southeastern Canada, Publication Number RR 93-5, Cornell University, Ithaca, New York, September 1993.

REFERENCE 1

Reference 1
1/1



Friday
December 14, 1990

Part II

Environmental Protection Agency

40 CFR Part 300
Hazard Ranking System; Final Rule

REFERENCE 2

United States
Environmental Protection
Agency

Solid Waste and
Emergency Response
(5204G)

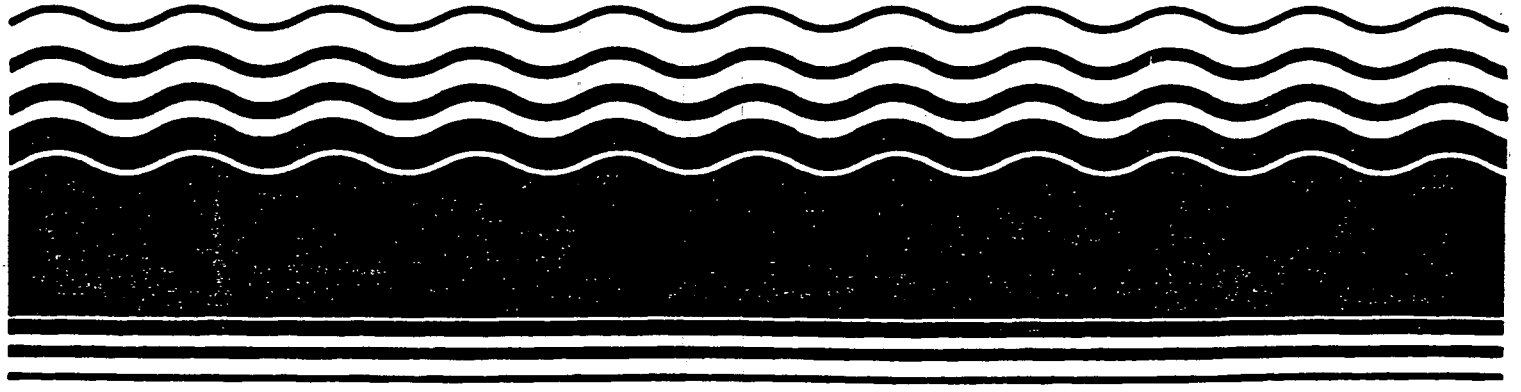
REFERENCE 9200.4-18
P. 1 OF 1

PB94-963506
EPA 540-R-94-0(
June 1994

EPA

Superfund Chemical Data Matrix

Rec'd
8/26/94



REFERENCE 3

Reference 5
1/8

EA Report DEC31A

PRELIMINARY INVESTIGATION OF THE NORTON LABS SITE CITY OF LOCKPORT, NIAGARA COUNTY, NEW YORK

PHASE I. SUMMARY REPORT

Prepared for

New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233

Prepared by

Ecological Analysts, Inc.
R.D. 2, Goshen Turnpike
Middletown, New York 10940

September 1984

Reference 5
2/8

EXECUTIVE SUMMARY

The Norton Labs Site (New York ID No. 932029, EPA ID No. NYD030212799) is an inactive landfill located south of Mill Street in Lockport, Niagara County, New York. Norton Labs is no longer in business. A portion of the site belongs to Somerset Railroad Corporation, Binghamton, New York. The site was closed in 1976 after what is believed to have been at least 12 years of operation. During its operation, it is estimated that over 2,000 tons of solid phenolic and polyster based plastics and at least 3,000 gallons of lubricating oil have been landfilled. In August of 1982, during the construction of a bordering railroad bed, two drums were punctured which released a green, oily substance. Subsequent analyses found the drum to contain approximately 175 mg/liter phenol and the surrounding soil to be contaminated with 6.5 mg/Kg PCBs.

Somerset Railroad Corporation has installed 22 monitoring wells along the railroad right-of-way in the vicinity of the Norton Labs site, including two shallow wells screened in the fill. Several wells were sampled in 1981 revealing only some possible oil and grease contamination within the fill. PCBs were not detected in any of the monitoring wells sampled.

The preliminary HRS scores for this site are as follows: Migration Score (S_M) = 6.10; Direct Contact Score (S_{DC}) = 0. The S_M is relatively low owing to a lack of any known drinking water wells or surface water intakes in the area. The available data are considered inadequate for preparing final HRS scores. Although Somerset Railroad has installed an extensive network of ground water monitoring wells at and near the site, the analyses completed to date have only included metals, PCBs, and volatile organics. Given the nature of wastes in the ruptured drums (phenolics) and the reported oil dumping, ground water should be examined for acid phenolics and base neutral compounds in order to confirm or rule out a release of contaminants to ground water. In the event that ground water contamination is confirmed, the maximum S_M (assuming a highly toxic and highly persistent compound is detected) would be 7.29.

7. SITE DATA

7.1 SITE AREA SURFACE FEATURES

The abandoned Norton Lab landfill is located at approximately 520 Mill Street in Lockport, New York. More specifically, it is situated about 100 feet south of Mill Street and 20 feet east of the Somerset Railroad Corporation cut, at an approximate elevation of 425 feet (Attachment 7.1-1). The area is an old field. Vegetation is sumac and teasel and grasses. Terrain is rolling, and the land rises gently to the south and east among limestone outcrops before sloping steeply away to Eighteen Mile Creek (due south) and the railroad (east). The creek bed is some 100 feet below the elevation of the landfill, and the railroad bed is about 26 feet below landfill grade. The railroad cut will eventually discharge any ground water it collects to Eighteen Mile Creek further downstream, so both surface runoff and ground water from the site vicinity will likely find a way into the creek. Land use in the immediate area, and upstream of the site, is industrial.

7.2 SITE HYDROGEOLOGY

Located in central Niagara County, the site is in the Eastern Lake Section of the Central Lowland Physiographic Province, near the base of the Niagara Escarpment. The site and surrounding area are underlain by four types of consolidated formations (Attachment 7.2-1); the oldest of which is the Queenston Formation of Ordovician age. This shale is reported to be 1,200-feet thick. On top of the Queenston Formation is approximately 11 feet of sandstone termed the Whirlpool Formation, followed by 27 feet of the Power Glen Formation, and finally Grimsby Formation.

Two ground water zones are located beneath the site (Attahcment 7.2-1). Zone 1 is located within the unconsolidated fill while Zone 2 is present in bedrock along the interface of the Grimsby and Power Glen formations. The water level in Zone 1 is 20 feet higher than the level in Zone 2. Due to the distance separting the two zones and the low permeability ($<5.1 \times 10^{-5}$ - see boring log

D-67), there is little vertical movement of ground water. The direction of Zone 2 ground water flow is to the west. Woodward-Clyde Consultants determined that ground water within Zone 1 (the unconsolidated fill material) is flowing north towards Mill Street (Attachment 7.3-3). The water level within the fill is less than 5 feet beneath the surface.

The Grimsby Formation protrudes through the surface in the site vicinity. The natural overburden material is a shallow layer of glacial till and soil; waste material comprises the remainder of the unconsolidated overburden.

It should be noted that only a partial copy of Attachment 7.2-1 is included in this report. Information was selectively included for the following borings: D-66, D-67, D-68A, D-69, and D-70. These borings/wells are within or nearest to the Norton landfill (Attachment 7.3-1).

7.3 SUMMARY OF PAST SAMPLING AND ANALYSIS

Ground Water

RECRA Research, Inc. collected ground water samples from the 22 wells placed by Bechtel Civil and Minerals, Inc. in the area of the site (locations shown in Attachment 7.3-1). Samples were collected on 3 and 4 November 1981 (Attachment 7.3-2). Results, pertinent to this report, indicate the presence of iron (260 mg/liter) and a total recoverable oil and grease concentration of 73 mg/liter. A second group of samples collected by Recra Research on 13, 16, and 17 November 1981 again indicated the presence of oil and grease (7 mg/liter) and zinc within the landfill.

On 15 November 1981, Woodward-Clyde Consultants, Inc., retained by the Somerset Railroad Corporation, collected samples from 9 of the 22 wells which Bechtel had placed (Attachment 7.3-3). The samples were analyzed for arsenic, lead, barium, cadmium, total chrome, nickel, zinc, copper, mercury, beryllium, and volatile organics. Only arsenic (0.068 mg/liter), zinc (0.400 mg/liter), and barium (1.80 mg/liter) were detected. Detection limits, however, were established at ground water quality standards and retesting was ordered by the

Reference 5
5/8

NYSDEC (Attachment 7.3-4). On 27 and 28 April 1982, samples were again collected from the same nine wells and analyzed at lower detection limits (Attachment 7.3-5). The results indicated the presence of arsenic (0.05 mg/liter), cadmium (0.005 mg/liter), chromium (0.008 mg/liter), lead (0.066 mg/liter), zinc (0.180 mg/liter), and oil and grease (3.17 mg/liter). PCBs were not detected (<0.50 µg/liter) nor were total organic halogens (<0.07 µg/liter) in any of the wells tested. Only arsenic and lead in well D-68 (screened in bedrock at 48-57 feet) exceeded state ground water standards. Oil and grease were highest in well D-70 (screened at 10-19 feet in the landfill).

Surface Water

On 15 November 1981, Woodward-Clyde Consultants collected a sample from Eighteen Mile Creek at the approximate location where the proposed railroad cut was to feed into the creek (Attachment 7.3-3). The sample was analyzed according to the same high detection limits set for the ground water samples collected on the same date. The results indicate a presence of zinc at 35 mg/liter.

Air

No data are available.

Soil

Soil contaminated by leaking drums was analyzed on 27 August 1982 for polychlorinated biphenyls (PCBs) (Attachment 6-4). The results indicated that the oily soil had a PCB concentration of 6.5 ppm.

A sample was collected directly from the leaking drum from the determination of its content. The drum waste was received at RECRA Research on 29 October 1982, whereupon it was evaluated for the characteristics of corosivity, ignitability, reactivity, and EP toxicity. Most notably, the results indicate the presence of phenol (175 mg/liter), lead (0.097 mg/liter), and barium (5.2 mg/liter) (Attachment 7.3-6).

Reference 3
6/8

8. ADEQUACY OF AVAILABLE DATA TO PREPARE FINAL HRS

The available data are considered inadequate for preparing final HRS scores. Although there is an extensive network of ground water monitoring wells at and near the site, the analyses completed to date have only included metals, PCBs, and volatile organics. Given the nature of wastes in the ruptured drums (phenolics) and the reported oil dumping, ground water should be examined for acid phenolics and base neutral compounds in order to confirm or rule out a release of contaminants to ground water. In the event that ground water contamination is confirmed, the maximum S_M (assuming a highly toxic and highly persistent compound is detected) would be 7.29.

It should be noted that no wells have been installed north of the Norton Labs landfill, which has been determined to be the direction of ground water flow within the landfill. However, given the available data, the need for a downgradient shallow well is not anticipated, particularly if existing wells within the fill fail to show any appreciable contamination.

Reference 5
7/8

9. PHASE II WORK PLAN

9.1 DETAILED WORK PLAN

In order to rule out the possibility of ground water and/or surface water contamination at the Norton Labs site, additional sampling of existing onsite monitoring wells and surface waters along the railroad cut is recommended. If these data can be obtained from the Somerset Railroad, no Phase II testing is recommended.

9.1.1 Ground Water Sampling

It is recommended that ground water samples be obtained from the following monitoring wells at the Norton Labs site: D-69 and D-70. These samples are to be analyzed for the acid phenolics and base neutral priority pollutants at a minimum. For cost estimating purposes, full priority pollutants are assumed.

9.1.2 Surface Water Sampling

It is recommended that one sample of surface water be collected from along the railroad cut prior to discharge into the wetland at Eighteen Mile Creek south of the Norton Labs landfill. This sample would be analyzed for complete priority pollutants.

9.2 HEALTH AND SAFETY PLAN

Activities

Phase II activities include surface and ground water sampling.

General Corporate Occupational Health and Safety (COSH) Plan

The four levels of personnel protection which have been identified for use in the current project are summarized below.

Reference 2
8/8

9.3 COST ESTIMATE

Work Element	Estimated Cost
Ground Water and Surface Water Sampling	2,000
Laboratory Analysis	3,600
Remedial Cost Estimates	2,500
Report Preparation	2,500
Project Management and Administration	2,500
Total Estimated Cost	$ 13,100

REFERENCE 4

Reference 4
1/8

EA Report DEC52C

ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES IN THE STATE OF NEW YORK

PHASE II INVESTIGATIONS
NORTON LAB
CITY OF LOCKPORT, NIAGARA COUNTY
NEW YORK ID NO. 932029

Prepared for

Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-0001

Prepared by

EA Science and Technology
R.D. 2, Goshen Turnpike
Middletown, New York 10940

A Division of EA Engineering, Science, and Technology, Inc.

April 1988

Reference 7
2/8

The Phase II investigation conducted by EA consisted of: A record search to obtain information on site history; a site inspection and interviews to update and document current site conditions; field activities, including geophysical survey consisting of EM grid, resistivity sounding, and grid proton magnetometer survey; monitoring well installation (2 deep and 3 shallow wells); surveying of well casings; pump tests; and sampling of ground water for analysis of the Hazardous Substance List of inorganic parameters and organic compounds.

Analytical results of samples collected from the five Phase II monitoring wells indicate that the landfill is releasing iron, copper, and sodium to the ground water in the vicinity of the site.

The final HRS score for the site is as follows: Migration Score (S_M) = 5.64 [Ground-Water Route (S_{GW}) = 4.47, Surface Water Route (S_{SW}) = 8.68, and Air Route (S_A) = 0]; Direct Contact Score (S_{DC}) = 50.00; and Fire and Explosion Score (S_{FE}) = NA.

A preliminary evaluation of potential site remedial alternatives is presented in Chapter 6.

Reference 4
3/8

3. SCOPE OF WORK

3.1 RECORD SEARCH/DATA COMPILATION

A record search/data compilation and interviews were conducted as part of the Phase II investigation of the Norton Lab site. Appendix 1.3.1-1 contains a list of agencies and individuals contacted.

3.2 FIELD ACTIVITIES

3.2.1 Site Reconnaissance

EA Science and Technology conducted a site reconnaissance on 17 April 1985 to familiarize key project personnel with the site. During the site reconnaissance, visible waste and/or filled areas were located, tentative locations for test borings/observation wells and sampling were selected, accessibility was evaluated, and HNu measurements (upgradient and site-wide) were obtained to help the Safety Officer develop specific health and safety requirements for the field activities. No organic vapors were detected above background by the HNu at the site during the site reconnaissance. Photographs of the site were taken and significant features were noted on an aerial photograph (Scale: 1 in. = 200 ft), dated 16 November 1982 of the site.

Reference 7
4/8

The Norton Lab Landfill covers an area of approximately 2-3 acres. The areal extent of the landfill to the east is unknown. A portion of the Norton Lab Landfill (approximately 0.4 acres) at the east-southeast end, is overlain by another landfill referred to as the McGonigle-Hilgar Landfill (Figure 4-1), which is assumed to be the "Area of Exposed Debris" shown on Figures 1-2 and 3-1. The McGonigle-Hilgar Landfill was used by the McGonigle & Hilgar Roofing Company from 1978 to 1982 for the disposal of roofing (asphalt, insulating material, tar paper) and general construction debris resulting from structural demolition. Reportedly, McGonigle & Hilgar Roofing Company deposited these waste materials on the ground surface and periodically spread the wastes out over the ground surface. The depth of the McGonigle-Hilgar Landfill overlaying the Norton Lab Landfill is 6-8 ft (Appendix 1.4.1-6). Eventually, some of the McGonigle-Hilgar Landfill was covered over with soil and is presently vegetated with some areas of exposed debris.

In 1981, Somerset Railroad Corporation conducted a hydrogeologic investigation to evaluate ground-water flow direction relative to a proposed railroad cut to be constructed on the west perimeter of the Norton Lab site (Appendix 1.4.1-6). The investigation included installation of 22 monitoring wells of which five were placed at the Norton Lab Landfill (Figure 4-1). Ground-water samples were collected for determination of several chemical parameters with only iron exceeding the New York State Ground Water Quality Standards for Class GA Waters (a more detailed description of the analytical results is presented in Section 4.4).

Reference 4
5/8

acetone, iron, copper, and sodium. Iron and copper were detected at concentrations 10 times greater in shallow well NL-4 than in upgradient shallow well NL-2. Sodium was detected 10 times greater in deep well NL-3 than in upgradient deep well NL-1. Copper concentrations were below drinking water quality standards in both the upgradient and downgradient samples. For NL-1 and NL-3, Cr and Zn were detected, however, contamination in the trip blank was greater than required levels, therefore, was not used. Acetone was detected in Wells NL-1, NL-3, and NL-5 at significant concentrations, however, acetone was required for cleaning of purging and sampling equipment used in the wells and may have been introduced during sampling. Lower levels were also found in the trip blank. Magnesium also was detected at elevated levels in all of the wells (Table 4-1). Due to missed holding times, the five Phase II monitoring wells were resampled and analyzed for pesticides and PCB of the Hazardous Substance List. No PCB or pesticides were detected above the contract required detection limits in any of the wells (Appendix 3)

In order to confirm a release of contaminants from the site for the purpose of HRS, there must be a significant increase in the concentration of a chemical parameter between the upgradient and downgradient sampling points at the site. EPA considers a significant increase to be at least a 10-fold increase when the same parameters are detected in the upgradient sample, or three times the detection limit for parameters not detected in upgradient sample. Therefore, an observed release to ground water is indicated based on the detection of increased concentrations (ten times) of iron, copper, and sodium in downgradient wells. The NCHD indicated that the parameters found in the wells (magnesium, iron, and sodium) are found higher than drinking water standards in

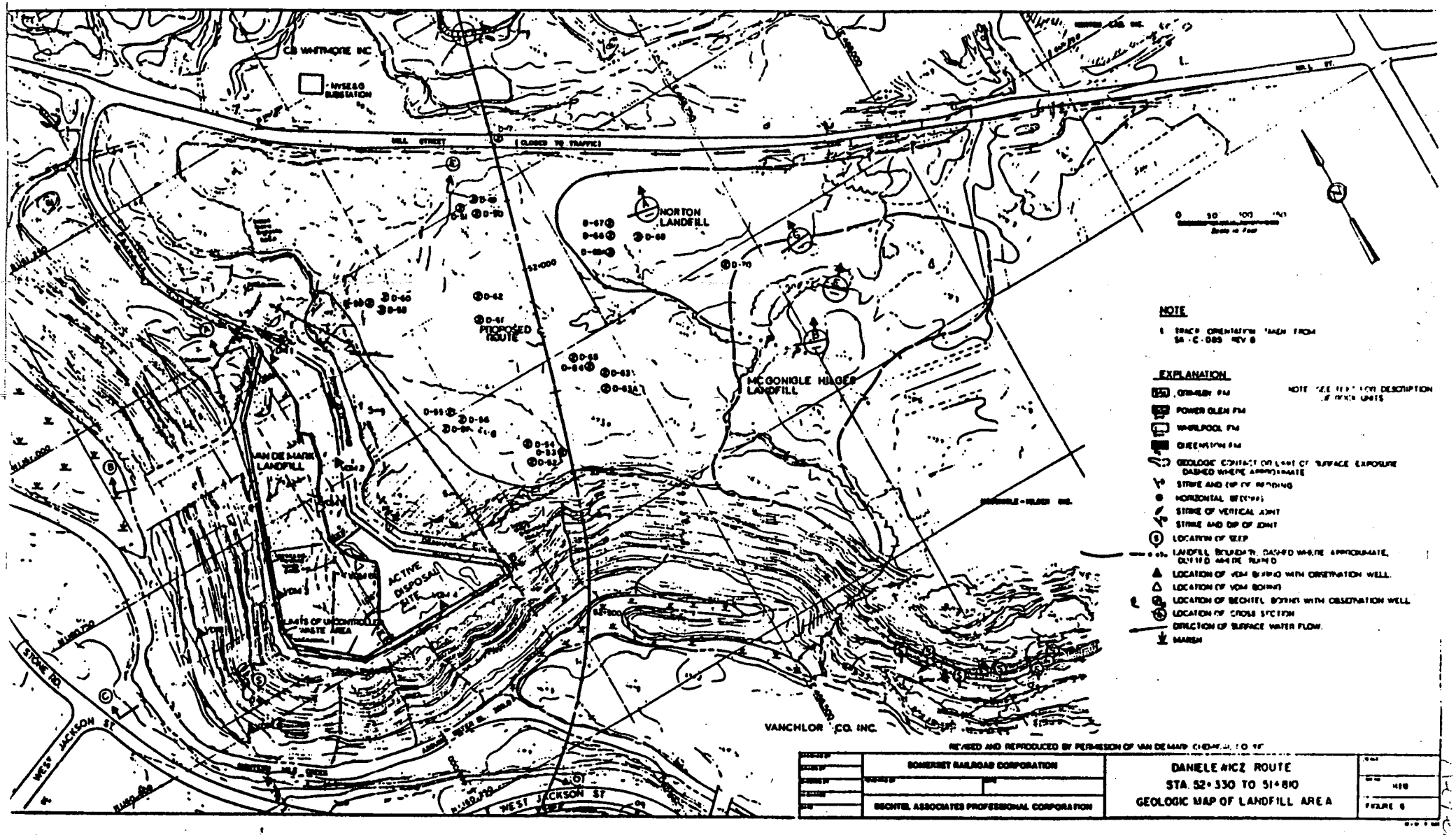

NORTON LANDFILL
MCGONIGLE HILGER LANDFILL
VAN DE MARK LANDFILL
ACTIVE DISPOSAL SITE
PROPOSED ROUTE
NOTE
EXPLANATION
POWER GLEN FM
WHIRLPOOL FM
VANCHLOR CO. INC.
WEST JACKSON ST
SOMERSET RAILROAD CORPORATION
BECHTEL ASSOCIATES PROFESSIONAL CORPORATION
DANIELE NICZ ROUTE
STA. 52+330 TO 51+810
GEOLOGIC MAP OF LANDFILL AREA
FIGURE 6

FIGURE 4 -1

TABLE 4-1 RESULTS OF DETERMINATIONS CONDUCTED ON GROUND WATER SAMPLES COLLECTED FROM NORTON LAB SITE, LOCKPORT, NEW YORK, 13 NOVEMBER 1985 AND 3 APRIL 1986.

Parameter	Deep Upgradient NL-W1	Deep Upgradient[a] NL-W1	Shallow Upgrad. NL-W2	Deep Downgrad. NL-W3	Deep Downgrad.[a] NL-W3	Shallow Downgradient NL-W4	Shallow Downgradient NL-W5	Trip Blank	Trip Blank[a]	VOA Blank	VOA Blank[a]	BNA Blank	BNA Blank[a]
Volatiles (ug/L)													
Methylene Chloride	BCRDL	BCRDL[b]	BCRDL	BCRDL[b]		BCRDL[b]	BCRDL[b]	BCRDL[b]	9B	BCRDL	BCRDL		
Acetone	140	BCRDL	BCRDL	490		BCRDL	76	21	BCRDL				
2-Butanone	BCRDL	BCRDL		BCRDL		BCRDL	BCRDL	BCRDL					
1,1-Dichloroethene				10[c]									
Trichloroethene				5[c]									
Benzene				BCRDL[c]									
Toluene				BCRDL[c]									
Chlorobenzene				BCRDL[c]							BCRDL		
Chloroform													
Semi-Volatiles (ug/L)													
Dibenzofuran	BCRDL												
Fluorene	BCRDL												
Phenanthrene	BCRDL												
Anthracene	BCRDL												
Fluoranthene	BCRDL												
Pyrene	BCRDL												
Benzo(a)anthracene	BCRDL												
Bis(2-ethylhexyl) phthalate	12b	BCRDL[b]	11B	13B		BCRDL[b]	14B	15B	BCRDL[b]			BCRDL	11
Chrysene	BCRDL												
Benzo(B+K)Fluoranthene[d]	BCRDL												
Benzo(a)pyrene	BCRDL												
Metals (mg/L)													
Aluminum	<0.20	0.46	3.30	0.48		4.10	1.80	<0.20	<0.04				
Antimony	<0.01	<0.005	<0.01	<0.005		<0.016	<0.01	<0.01	<0.005				
Arsenic	<0.002	<0.005	<0.002	<0.005		<0.007	<0.002	<0.002	<0.005				
Barium	0.76	0.80	0.03	0.009		0.13	0.22	<0.02	<0.04				
Beryllium	<0.0005	<0.0005	<0.0005	<0.002		<0.005	<0.005	<0.005	<0.002				
Cadmium	<0.0005	<0.0005	0.0007	<0.0005		0.0021	0.0007	<0.0005	<0.0005				
Calcium	140	110	44.0	20.0		64.0	92.0	<1.00	0.50				
Chromium	0.002	0.045	0.003	0.04		0.010	0.003	<0.001	0.05				
Copper	<0.005	0.04	0.007	0.10		0.20	0.007	<0.005	<0.02				
Iron	6.30	6.00	0.42	0.66		9.80	0.78	<0.05	0.25				
Lead	0.005	0.019	0.007	0.037		0.019	0.007	<0.002	<0.005				
Magnesium	14.0	13.90	16.0	3.41		16.0	50.0	<0.01	<0.01				
Manganese	3.40	2.89	0.22	0.09		0.11	0.25	<0.01	<0.01				
Mercury	<0.0002	<0.0002	<0.0002	<0.0002		0.0013	<0.0002	<0.0002	<0.0002				
Nickel	<0.04	0.04	<0.04	<0.02		0.10	<0.04	<1.00	0.40				
Potassium	3.00	3.90	4.00	12.0		8.00	4.00	<1.00	0.40				

Reference 4
7/8

TABLE 4-2 (Cont.)

Parameter	Deep Upgradient NL-W1	Deep Upgradient NL-W1[a]	Shallow Upgrad. NL-W2	Deep Downgrad. NL-W3[a]	Shallow Downgradient NL-W4	Shallow Downgradient NL-W5	Trip Blank	Trip[a] Blank	VOA Blank	VOA[a] Blank	BNA Blank	BNA Blank[a]
Metals (cont.)												
Sodium	40.0	46	38.0	406	28.0	34.0	<1.00	2.5				
Zinc	<0.02	0.043	0.13	0.057	2.60	0.12	<0.02	0.024				
Total Cyanide	<0.01	<0.01	0.04	<0.01	<0.01	0.01	<0.01	<0.01				
Total Phenols	<0.02	<0.05	<0.02	<0.05	<0.02	<0.02	<0.02	<0.05				

NOTE: BCRDL = Below Contract Required Detection Limit.
No pesticides or PCB were detected above the contract required detection limit as the result of the resampling on 17 March 1987.

a = Results of analyses for Samples collected 3 April 1986.
b = Parameter was detected in the method blank.
c = Probable contamination from matrix spike standard.
d = Unable to resolve isomers; results represent total of both isomers.

Reference 4
8/8

REFERENCE 5

Reference 5
1/12

SOMERSET RAILROAD CORPORATION

HYDROGEOLOGIC STUDY

DANIELEWICZ ROUTE

Station 51+810 to 52+330

BECHTEL CIVIL & MINERALS, INC.

JOB NO. 14818

FEBRUARY 1982

Reference 5
2/12

EXECUTIVE SUMMARY

The hydrogeologic study of the Danielewicz Route from Station 51+810 to 52+330 authorized September 15, 1981, in letter BNE-142, has as its objectives the determination of ground water flow direction relative to the proposed railroad cut through this area, and, based upon chemical indicators, the possibility of movement of known landfill constituents into the ground water intercepted by the proposed railroad cut. The study utilized ground water monitoring wells in concert with the analysis of selected chemical parameters to fulfill these objectives.

Analysis of ground water level data indicate that flows are generally east to west within the rock strata intercepted by the railroad cut. Due to the direction of ground water flow and the relative elevations of the Van De Mark Landfill and the railroad, the proposed cut should not receive any ground water from the Van De Mark Landfill which lies to the west. Chemical analyses of ground water samples from the response tested and bailed wells utilizing parameters indicative of inputs from the Van De Mark Landfill confirm this conclusion.

The study area was explored to a maximum depth of 109 feet, the approximate elevation of Eighteenmile Creek. Four relatively isolated zones of ground water were found, each occurring at different depths. The upper two zones consist of a shallow ground water zone (Zone 1) found in the area of the Norton Landfill to the east of the railroad cut, and a somewhat deeper zone (Zone 2) which occurs along the contact between the Grimsby and Power Glen Formations. The two lower zones found along the contacts between the Power Glen and Whirlpool Formations (Zone 3) and the Whirlpool and Queenston Formations (Zone 4) will not be intercepted by the cut.

The railroad cut will occur within Zone 2 rock strata near the Grimsby-Power Glen Formation contact. However, since this rock has a low to negligible permeability, the quantity of Zone 2 ground water reaching the

Reference 5
3/12

SOMERSET RAILROAD CORPORATION
HYDROGEOLOGIC STUDY IN THE VICINITY
OF THE VAN DE MARK LANDFILL

1.0 INTRODUCTION

This report presents the results of the hydrogeologic investigation performed for the Somerset Railroad Corporation along the proposed Danielewicz Route from (approximately) Station 51+810 to 52+330 in the city of Lockport, New York (Figure 1). In this vicinity, the railroad grade descends to the north at a grade of approximately 1.6 percent. The descent from a bridge section crossing West Jackson Street and the Gulf requires a cut section between two landfills: the Van De Mark Landfill (VDM) on the west, and the Norton/McGonigle & Hilger (N/MH) Landfill on the east. The study was authorized pursuant to letter BNE-142 dated September 15, 1981, from Bechtel to New York State Electric and Gas Corporation.

Preliminary investigations performed during the Somerset Railroad alternative route selection analyses involved geologic field mapping and areal reconnaissance of the landfills and surrounding area. Concurrent with the field work was a search for existing data on the landfills from the files of owners and various public agencies.

The results of the preliminary investigation indicated that ground water levels in the area of the landfills could be at an elevation high enough to be intercepted by the cut between the two landfills (Figure 2). Sufficient data was not available, however, to determine the ground water flow direction nor the quality of the water which may be emanating from the landfills. To provide data necessary to evaluate the ground water levels, flow direction, and chemistry, 22 observation wells were installed. In-hole permeability testing was performed, water levels obtained and samples collected for chemical analysis. On the basis of these studies, an evaluation of the local ground water regime and a prediction of its interaction with the proposed railroad cut are presented.

Reference 2
4/12

7.0 GROUND WATER OCCURRENCE

The rocks underlying the study area appear to have little to no primary (porous) permeability. The occurrence and movement of ground water is in the fractures and joints of the rocks. The core from the exploratory holes and the permeability testing indicate that more open jointing tends to occur near the contacts between formations. However, none of the zones tested are even of moderate permeability (Table 5). More open and frequent jointing appears to be present within the Whirlpool and Power Glen Formations near the cliff adjacent to West Jackson Street, which indicates that stress relief has occurred adjacent to this feature.

Water levels have been measured in the observation wells constructed during this program and the existing Van De Mark Landfill wells. They show that large differences in levels are present between ground water zones. To illustrate those relationships, water level contour maps shown on Figures 8 through 10, hydrographs shown on Figure 11 (sheets 1 through 8), and sections shown on Figure 7 (sheets 1 through 5) have been prepared. In addition, water levels recorded in the Van De Mark wells are shown on Figure 12. These data show that at least four zones of ground water are present between the ground surface and the Queenston Formation.

The first zone monitored (Zone 1) is ground water present in the area of the Norton Landfill. Only observation wells D-69 and D-70 are monitoring this zone. As illustrated by the section shown on Figure 7, sheet 5, the water level in Zone 1 is more than 20 feet higher than the level in Zone 2, the Grimsby/Power Glen contact. Considering the large difference in head and the low permeability of the formations underlying the landfill, this indicates little to no vertical movement of ground water. It can be seen on the section that ground water in this zone may extend to the cut. The upper portions of the cut will be within 10 feet of the backfill contained in the Norton Landfill.

The second zone monitored (Zone 2) is ground water at the Grimsby/Power Glen contact. Section D-D' (Figure 7, sheet 4) has been constructed along the proposed cut alignment. It can be seen on the section that

Reference 5
5/12

8.0 GROUND WATER QUALITY

The centerline of the proposed Danielewicz right-of-way passes through a cut approximately 125 feet (at its closest point) east of the Van De Mark Chemical Company Landfill and approximately 60 feet (at its closest point) west of the Norton Landfill. A description of these landfills is presented in Section 3.0.

The base of the cut is below existing water table elevations. For this reason, a ground water quality program was initiated to provide additional indicators of the movement of ground water into the railroad cut from the landfill areas to the east and west.

8.1 Sampling and Analytical Procedures

Based on an investigation of the existing New York State Department of Environmental Conservation records, Niagara County Health Department files, and other investigations of the history of the two landfills, a list of chemical parameters to be determined in the ground water was established. The list consisted of eight chemical parameters (Tables 8 through 10) of which chloride was expected to be the prime indicator of chemical contribution to ground water from the Van De Mark Landfill and oil and grease from the Norton Landfill. Twenty-two wells were installed at the locations and depths shown in Figure 3. The details of well construction are given in Figure 5 and Section 5.0.

Sampling and chemical analyses were performed by RECRA Research Incorporated of Tonawanda, New York. Two rounds of sampling and analyses were undertaken in November, 1981. The first round of sampling occurred on November 2 and 3, following completion of drilling and response testing of the wells. Each of the Zone 1, 2, 3, and 4 wells was sampled at that time, with samples split in the field to facilitate duplicate analyses. Following receipt of the first round analytical results, it was determined that the Zone 1 and 2 wells would be resampled. These wells were then purged according to EPA guidelines in preparation for the second round of sampling and analyses (Section 5.2).

Reference 5
6/12

The second round samples were withdrawn from the purged Zone 1 and 2 wells in mid-November. All sampling was accomplished using a steel pipe bailer, with a new bailer utilized to sample each well. Conductivity, pH, and temperature determinations were made in the field at the time of sampling. All other analyses were performed in RECRA Research, Incorporated's laboratory facilities in Tonawanda, New York. All laboratory analyses were performed in accordance with EPA methodologies. The results of the first round analyses are shown in Tables 8A, B, C, and D. Appendices C-1 and C-2 contain the laboratory data sheets from both the first and second round of analyses. The second round analyses included additional chemical parameters at the direction of Somerset Railroad Corporation.

8.2 Discussion of Results

8.2.1 Van De Mark Landfill

Tables 9 and 10 contain the most recent quarterly analyses of ground water samples taken from Van De Mark Chemical Company monitoring wells installed at that company's landfill as part of their routine landfill monitoring program. Locations of the wells are shown on Figures 2 and 3 and marked VDM 1, 2, 3, and 4. They are presented here for comparison with analyses taken in the area of the proposed railroad right-of-way, to the east of the landfill.

Tables 8A, B, C, and D show results of the first round analyses from the 22 unpurged wells installed at the different elevations necessary to allow sampling of each of the water bearing zones in the area independently.

- Table 8-A shows results from the Grimsby-Power Glen interval (Zone 2).
- Table 8-B shows results from the Power Glen-Whirlpool interval (Zone 3).

TABLE 2

SOMERSET RAILROAD
VAN DE MARK/NORTON McGONIGLE HILGER LANDFILL
OBSERVATION WELL DATA

BORING NO.	WELL NEST NO.	GROUND SURFACE ELEVATION	ELEV. OF BOTTOM WELL	RISER ELEV.	SCREEN INTERVAL (EL.)	FORMATION SCREENED
D-49	1	459.8	408.5	461.90	409.5 - 418.8	Power Glen/Whirlpool
D-50	1	460.8	369.8	462.69	373.2 - 410.3	Whirlpool/Queenston
D-51	1	459.5	418.5	461.77	419.5 - 444.8	Grimsby/Power Glen
D-52	2	466.5	380.5	468.69	381.5 - 405.5	Whirlpool/Queenston
D-53	2	467.4	421.8	469.18	422.8 - 442.3	Grimsby/Power Glen
D-54	2	466.4	408.4	468.46	409.4 - 424.3	Power Glen/Whirlpool
D-55	3	467.4	422.4	469.36	423.3 - 439.4	Grimsby/Power Glen
D-56	3	467.3	360.3	469.44	362.3 - 407.5	Whirlpool/Queenston
D-57	3	467.0	407.5	469.27	408.5 - 426.2	Power Glen/Whirlpool
D-58	4	465.7	414.5	467.68	415.6 - 440.7	Grimsby/Power Glen
D-59	4	465.0	365.0	467.25	366.0 - 409.1	Whirlpool/Queenston
D-60	4	465.7	407.7	467.75	408.9 - 422.7	Power Glen/Whirlpool
D-61	5	467.4	421.5	469.31	422.5 - 441.4	Grimsby/Power Glen
D-62	5	469.0	409.9	471.04	410.9 - 422.7	Power Glen/Whirlpool
D-63A	6	469.6	368.6	471.63	369.4 - 404.6	Whirlpool/Queenston

TABLE 2 (Continued)

BORING NO.	WELL NEST NO.	GROUND SURFACE ELEVATION	ELEV. OF BOTTOM WELL	RISER ELEV.	SCREEN INTERVAL (EL.)	FORMATION SCREENED
D-64	6	469.1	421.4	471.37	422.4 - 437.1	Grimsby/Power Glen
D-65	6	469.1	406.1	471.33	407.1 - 422.1	Power Glen/Whirlpool
D-66	7	464.4	426.4	466.33	427.4 - 440.4	Grimsby/Power Glen
D-67	7	462.9	362.9	465.91	363.9 - 408.9	Whirlpool/Queenston
D-68A	7	465.2	407.2	467.55	408.2 - 421.2	Power Glen/Whirlpool
D-69		464.4	447.0	466.11	447.2 - 458.4	Grimsby/Soil Landfill
D-70		466.3	446.9	468.10	447.2 - 458.3	Grimsby/Soil Landfill

Reference 5
8/12

TABLE 8-D

RESULTS OF CHEMICAL ANALYSES PERFORMED BY RECRA RESEARCH, INC.

ZONE 1	MISC. SOIL - ELEV. 447.2 - 456.6							
Well No.	Temp. (C)	pH	Specific Conductance µmhos/cm	TOC mg/1	TDS mg/1	CL mg/1	Oil & Grease mg/1	T Fe mg/1
D69	14	6.7	800	6.8	670	29	14	7.4
	14	6.8	780	8.7	730	29	<5	89
D70	14.5	6.85	640	24	570	31	73	120
	13	6.80	540	33	590	32	31	260

Reference 5
9/12

TABLE 8-A

RESULTS OF CHEMICAL ANALYSES PERFORMED BY RECRA RESEARCH, INC.

ZONE 2	GRIMSBY/POWER GLEN CONTACT ELEV. 419 - 437.2							
Well No.	Temp. (C)	pH	Specific Conductance µmhos/cm	TOC mg/1	TDS mg/1	CL mg/1	Oil & Grease mg/1	T Fe mg/1
D51	12.5	6.90	295	2.4	260	28	<5	6.1
	12	7.15	295	5.2	260	27	<5	14
D53	12	6.65	353	8.1	280	32	<5	3.8
	12	6.75	360	4.2	340	32	<5	2.5
D55	12	6.55	430	4.8	370	37	<5	7.1
	11.5	6.80	430	4.7	360	37	<5	4.8
D58	DRY HOLE							DRY HOLE
D61	10	6.65	420	6.0	410	36	26	2.0
	10	6.75	510	10	390	36	<5	11
D64	11.5	8.20	244	5.7	180	24	8	1.8
	13.0	8.45	242	6.8	170	23	<5	21
D66	13	7.50	1,040	4.0	860	200	<5	8.0
	12.5	7.45	1,000	4.4	830	190	<5	1.6

Reference 3
10/12

GROUND WATER OBSERVATION WELL REPORT

Reference 11/12

PROJECT Somerset Railroad - Van De Mark

LOCATION N1,160,859 E468,567

Date Completed 10/28/81 Original Depth 38.0'

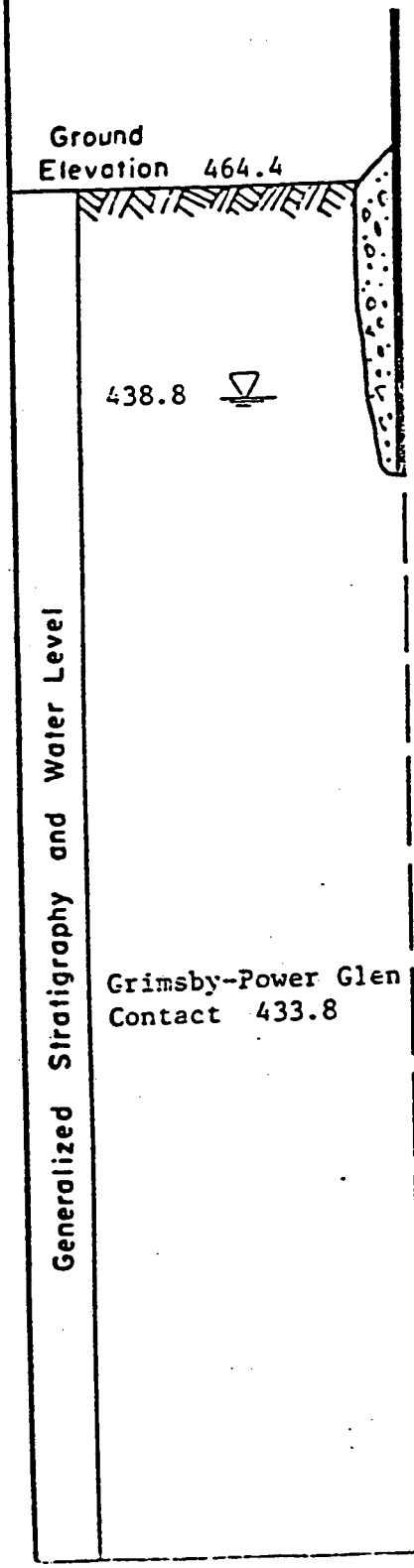
Inspected By J. C. Isham Date 10/28/81

Checked By _____ Date _____

Well No. D-66

Aquifer Grimsby-Power Glen Contact

Elev. Interval 426.4-440.4'



Elevation of top of surface casing / riser pipe.	466.53/466.33
Heigth of top of surface casing / riser pipe above ground surface	2.2/2.0'
Depth of surface seal below ground surface	20.8'
Type of surface seal: Cement	
I.D. of surface casing.	4"
Type of surface casing: Cast iron with lock cap	
Depth of surface casing below ground	3.0'
I.D. of riser pipe.	2"
Type of riser pipe: Sch 40 PVC	
Diameter of borehole	
Depth of borehole	38.0'
Type of backfill: Cement	
Elev./depth top of seal.	443.6/20.8'
Type of seal: Bentonite	
Elev./depth bottom of seal.	440.4/24.0'
Type of sand pack. Q-02 (fine to med. sand)	
Depth of top of sand pack.	440.4/24.0'
Elev./depth top of screened section.	437.0/27.4'
Type of screened section: Sch 40 PVC	
Describe openings 0.010" machine slot - horizontal slot	
I.D. of screened section.	2"
Elev./depth bottom of screened section.	427.4/37.0'
Length of blank section.	1'
Elev./depth bottom of plugged blank section.	426.4/38.0'
Elev./depth bottom of sand column.	426.4/38.0'
Type of backfill below observation pipe.	
Elev/depth of hole.	426.4/38.0'

GROUND WATER OBSERVATION WELL REPORT

Appendix 12/12

PROJECT Somerset Railroad - Van De Mark

LOCATION N1,160,836 E468,601

Date Completed 10/28/81 Original Depth 18'

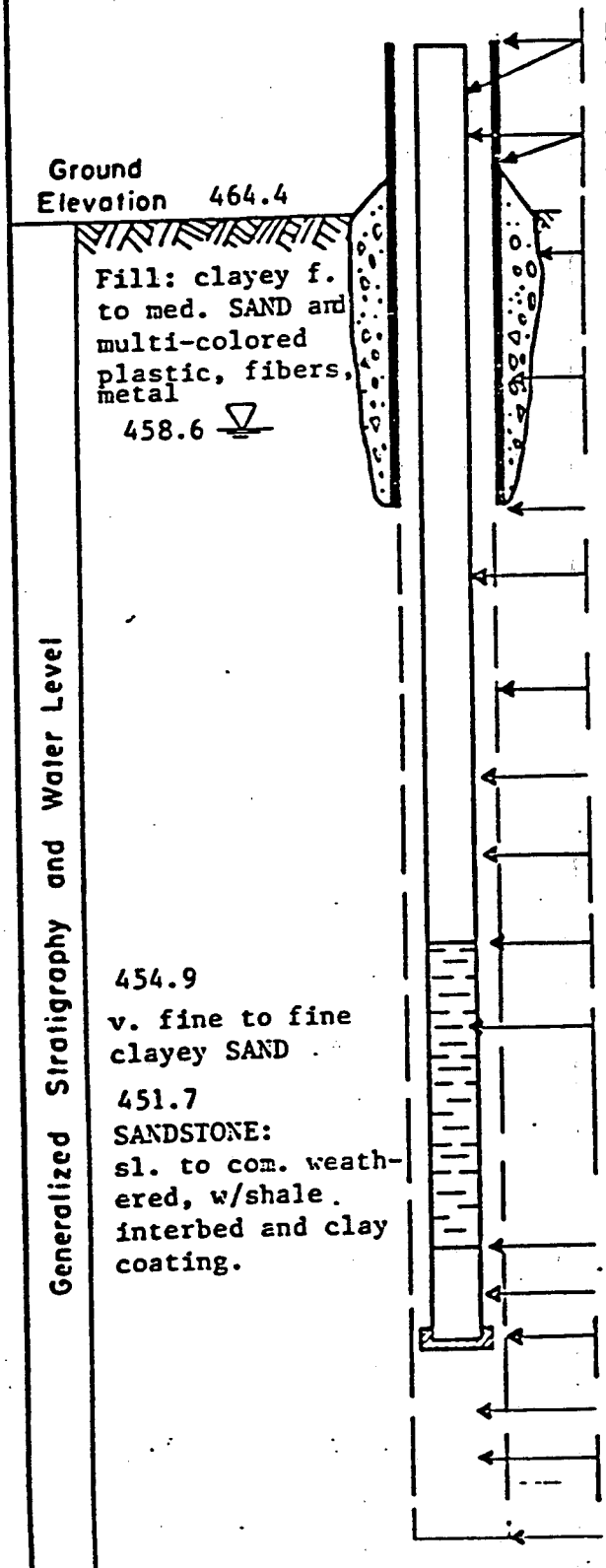
Inspected By C. F. Wall Date 10/28/81

Checked By _____ Date _____

Well No. D-69

Aquifer Grimsby-Soil-Landfill

Elev. Interval 446.4-458.4'



Elevation of top of surface casing / riser pipe.	466.56/466.11'
Heigth of top of surface casing / riser pipe above ground surface	2.2/1.75'
Depth of surface seal below ground surface	4.2'
Type of surface seal: Cement	
I.D. of surface casing.	4"
Type of surface casing: Cast iron with lock cap	
Depth of surface casing below ground	3"
I.D. of riser pipe.	2"
Type of riser pipe: Sch 40 PVC	
Diameter of borehole	10" to 11.4' 6" to 18.0'
Depth of borehole	18.0'
Type of backfill: Cement	
Elev./depth top of seal.	460.2/4.2'
Type of seal: Bentonite	
Elev./depth bottom of seal.	458.4/6.0'
Type of sand pack. Q-02 (fine to med. sand)	
Depth of top of sand pack.	6.0'
Elev./depth top of screened section.	456.65/7.75'
Type of screened section: Sch 40 PVC	
Describe openings 0.010" machine slot - horizontal slot	
I.D. of screened section.	2"
Elev./depth bottom of screened section.	447.25/17.15'
Length of blank section.	0.25'
Elev./depth bottom of plugged blank section.	447/17.4'
Elev./depth bottom of sand column.	447/17.4'
Type of backfill below observation pipe. Natural material	
Elev./depth of hole.	446.4/18.0'

REFERENCE 6

Reference 6
1/1

NIAGARA COUNTY HEALTH DEPARTMENT
525 REWLEY BUILDING
LOCKPORT, NEW YORK
TEL. 434-2835

DUDLEY A. HILL, M.D.
COMMISSIONER

JERAULD A. CAMPBELL, M.D.
DEPUTY COMMISSIONER

DIVISION OF
ENVIRONMENTAL HEALTH SERVICES

EUGENE F. SEEBALD, P.E.
ASSISTANT COMMISSIONER

May 7, 1965

Norton Laboratories, Inc.
Mill Street
Lockport, New York

Attention: Mr. Clinton Fleming
President

Dear Sir: Re: Conference Refuse Disposal

Herewith I am summarizing the details covered in our conference on May 6, 1965.

Present at the conference were yourself, Mayor Rollin Grant, City of Lockport, three members of your firm and the writer.

The problem of Norton Laboratories with respect to the disposal of solid waste was discussed and the following conclusions were reached after conference and inspection of your refuse disposal site:

1. There is no objection to the final disposal of fractionated plastic parts on the site being used for fill after compaction and covering.

2. The refuse from the domestic use of cafeteria and toilet room space will be disposed of in a sanitary manner either by incineration on the site or by being transported to an approved refuse disposal area.

3. Immediate investigation of the feasibility of salvaging waste paper products from your operation will be made, leading to an early solution to this problem.

4. A completely enclosed incinerator feasibility study will be investigated to dispose of waste paper products which do not lend themselves to salvage.

5. The disposal site of the company will be barricaded from access through the public thoroughfare adjacent to the plant.

6. Scavengers seeking to obtain salvage from the plastic refuse will be prohibited from the site.

7. A new access road from the plant property will be constructed to isolate the disposal site from public use.

It is requested that you advise this office by May 24th of your progress in complying with the previously set forth schedule of corrections.

Cont'd.

REFERENCE 7

Reference 1
1/2

Initial Contact ... by ...
Appointment Made 11/5/76 by J.E.I.
Plant or Phone Visit 11/22/76 by J.E.I.
Follow-up / / by
Form Completed 11/22/76 by J.E.I.
Comments:
[illegible]
[illegible]
[illegible]
dumped out back
on site

Company Name Norton Laboratories, Inc.
Address 521 Mill St. Lockport, N.Y. 14094
County Niagara Phone (716) - 433-6751
SIC Codes 1. 3079 3.
2. 4.

New York State Industrial Waste Survey
Department of Environmental Conservation
Division of Solid Waste Management
50 Wolf Road, Albany, N.Y. 12233 Telephone: (518) 457-6605

General Information

1. Company Name Norton Laboratories

   Mailing Address 521 Mill St., Lockport, N.Y. 14094
   (Street, City, State, Zip)

   Plant Location [✓] Same as above

   (Street, City, State, Zip)

2. If Subsidiary, Name of Parent Company Auburn Plastics Inc

3. Individual Responsible for Plant Operations John Fitesimmons
   Name

   [illegible] [illegible]
   Title Phone

4. Individual Providing Information [illegible]
   Name

   [illegible]
   Title Phone

5. Department of Environmental Conservation Interviewer John E. Iannotti

6. Standard Industrial Classification (SIC) Codes for Principal Products

Group Name	SIC Code (4 Digit)	Approximate % of [ ] Production [ ] Value Added
a. [illegible]	[illegible]	[illegible]
b.		
c.		
d.		

7. Processes Used at Plant
   a. mixing & blending
   b.
   c.
   d.
   e.

8. Products
   a. [illegible]
   b. [illegible]
   c.
   d.
   e.

Reference 1
2/2

e. Analysis of composition is /_/theoretical /_/laboratory /_/estimate
(attach copy of laboratory analysis if available)

f. Projected /_/increase, /_/decrease in volume from base year: _____% by July 1977;

_____% by July 1983.

g. Hazardous properties of waste: /✓/flammable /_/toxic /_/reactive /_/explosive

/_/corrosive /_/other (specify)_____

3. On Site Storage

a. Method: /_/drum, /_/roll-off container, /_/tank, /_/lagoon, /✓/other (specify) Small Containers

b. Typical length of time waste stored — /_/days, /_/weeks, /_/months

c. Typical volume of waste stored — /_/tons, /_/gallons

d. Is storage site diked? /_/Yes /_/No

e. Surface drainage collection /_/Yes /_/No

9. Transportation

a. Waste hauled off site by /_/you /_/others

b. Name of waste hauler_____

Address _____
Street City

( )
State Zip Code Phone

10. Treatment and Disposal

a. Treatment or disposal: /✓/on site /_/off site

b. Waste is /_/reclaimed /_/treated /✓/land disposed /_/incinerated

/_/other (specify) just dumped on land out back (no specified dumping area)

c. Off site facility receiving waste

Name of Facility_____

Facility Operator_____

Facility Location_____
Street City

( )
State Zip Code Phone

REFERENCE 8

Notes transcribed to logbook evening of Jan 18, 1995 from notes taken on site that afternoon.

L. Powell

Norton Labs Site Reconnaissance

Jan 18, 1995 arrive 1343

- meet Mr James Holden Sr & Jim Holden. sign release in case we enter any facilities
- short conference with Mr Holden regarding operations of Twin Lake Chemical Co., Mr Holden, Sr is president of Twin Lake Chemical and owner of land
- weather: overcast but clearing, slight breeze, warm (mid-40's F)
- personell: Leonard Powell - F.O.
  Ron Wells - H.S.O.
  Grethen Mason - observer
- Twin Lake Chemical Co is an active facility, producing phosgene & organic chloride acids
- workforce at Twin Lake Chemical is 15 people
- Vander Mark Chemicals Group is located immediately adjacent to Twin Lake Chemicals on the East side.
- Vanchlor Company, producing Aluminum Chloride, located South of Twin Lake

1/3

chemicals, along Eighteenmile Creek
- a steep slope is located at the rear (south) of Twin Lake Chemical's property
1415 introduce Mr Hoden to Ron Wells & Gretchen Maxson. Mr Hoden guides us on a brief tour of the site.
- view steep slope at rear of property, VanChlor Co buildings visible below Mr Hoden states that debris visible on slope is from a building that was burnt in early 1980's. Debris was placed on the slope & the building rebuilt.
- Aboveground storage tank labeled as Carbon Monoxide liquid is located in front of parking area in front of Twin Lake Chemical Co building.
- a new (not on map) railroad spur also situated in front of buildings A railcar tanker labeled Chlorine is setting on this railway spur
- two tanks on ground beside

waste storage building. Mr Hoden states the tanks are empty, unused, & are to be removed, and that underground waste is stored in the building
- a number of wooden pallets are located north of the waste storage building. Mr Hoden states that they are also property of Twin Lake Chemical
- area immediately North of the parking area, near the waste storage building is assumed to be the McKenzie - Hiser Land fill
- this area is not completely vegetated with tar and asphalt visible on the ground surface.
- continue tour of site to the North-Northwest, which is assumed to be the main portion of the Niagara Falls Landfill.
- this area is well vegetated with general small trees & a large number of bushes/shrubs. Numerous birds are visible & audible in the trees and bushes

Reference 8
2/3

- several medium - large stones are visible, suggesting disturbed soil and/or shallow bedrock.
- six wells located in the Northwest corner of the property. These wells appear to be in usable condition.
- a power line crosses the property near the Northwest corner.
- there is some standing water located under the power line.
- this water is in a ditch alongside and abandoned railway
- several plastic pipes are exposed along the ditch walls.
- another ditch has water flowing from the Mill Street area, under the railroad in use. This ditch drains into a storm sewer pipe located in the railway excavated road cut. Water flows south in this pipe along the ~~west~~ east side of the rail way cut. This pipe likely flows to the wastewater treatment plant on the west side of Eighteen-mile Creek.

- small triangular parcel of land immediately to North of the Northwest corner of property is not owned by Twin Lake Chemical according to Mr Hoden.

1325 - left site after informing Mr Hoden that we were leaving

1330 - stop by McGonigle - Hilger Roofing Co to introduce myself to Mr Arthur Hilger. He was not in but I left a card & memo w/ secretary

1340 - drive to road along South side of Eighteenmile Creek & view slope to rear of site

REFERENCE 9

11046/8-74

Reference 7
1/1

RECORD OF TELEPHONE CONVERSATION

DATE 2/17/95

TO File: Norton Labs / ~~Niagara Mat'l~~
NAME/FILE NO.

FROM L. Powell

CLIENT/PROJECT USEPA ARCS

SUBJECT use of old buildings @ Norton Labs Site

CHARGE: DEPT. NO. _____ CLIENT SYMBOL _____ OFS NO. _____

DISCUSSION WITH James Horden Sr., Twinlake Chemical Co., (716) 433-3824

The old buildings along the east boundary of the Norton Labs site are used by Twinlake Chemical Co. for storage of old equipment. The buildings are not entered on a regular ~~basis~~ basis. Mr Horden is not aware of where the closest well is located. However, Twinlake Chemical Co uses city water/sewage & he would expect houses on Mill Street would also. Van De Mark Chemical, adjacent to Twinlake Chemical, used

COMMENTS water from Eighteenmile Creek in processes in the facility, in the past, but Mr Horden did not know if they currently used water from the creek.

BY Leonard A Powell
NAME

_____
TITLE

_____
DEPT. NO.

CC:

REFERENCE 10

Reference ID
1/1

11046/6-74

RECORD OF TELEPHONE CONVERSATION

DATE December 29, 1994

TO Peter Carney, NYSElectric & Gas
NAME/FILE NO.

FROM Leonard Powell FWENC

CLIENT/PROJECT USEPA ARCS II

SUBJECT site access for site visit @ Norton Labs, Lockport NY

CHARGE: DEPT. NO. _____ CLIENT SYMBOL _____ OFS NO. _____

DISCUSSION WITH Peter Carney

Discussed site access to Norton Labs site in Lockport w/ Mr. Carney. Somerset Railroad, a subsidiary of NYSEG, owns a portion of the site. Mr Carney referred me to Mr James Rathberg as the environmental matters contact for NYSEG. But, since Mr Rathberg was out of the office, Mr Carney verbally agreed to site access by Ebasco personnel. He asked that future communications and the site access agreement letter go to Mr Rathberg.

COMMENTS

BY Leonard Powell
NAME

TITLE

DEPT. NO.

CC:

REFERENCE 11

Reference 11
1/5

RESULTS OF HYDROGEOLOGIC INVESTIGATION

OF

DANIELEWICZ ROUTE LANDFILLS

January 15, 1982

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists, and Environmental Scientists
201 Willowbrook Boulevard/P.O. Box 290
Wayne, New Jersey 07470

EXECUTIVE SUMMARY

Woodward-Clyde Consultants conducted a hydrogeologic investigation of the Norton/McGonigle Hilger Landfill complex which is located in close proximity to a segment of the proposed Danielewicz Route in Lockport, New York. Utilizing data previously collected by Bechtel, Woodward-Clyde Consultants reviewed the known hydrogeology of the area, conducted a terrain conductivity survey, and collected sample of groundwater from wells installed by Bechtel for analysis of parameters indicative of chemical groundwater pollution. These data were used to evaluate the effect that a proposed railroad cut in the vicinity of the landfills would have on groundwater.

The results of the analysis show that the proposed cut may affect groundwater in two zones. The upper zone is located in landfill materials in the Norton/McGonigle Hilger Landfills and the lower zone occurs in bedrock that will be excavated during construction of the cut. The results of the hydrogeologic analysis indicate that groundwater in the unconsolidated upper zone materials and in the landfill is separate from the groundwater that occurs in bedrock. Further, the probable flow directions of groundwater in the upper zone is northward toward Mill Street. Flow in the bedrock is westward from the area underlying the Norton/McGonigle Hilger Landfill towards the area of the proposed cut.

The samples were analyzed for those heavy metals and volatile organic chemical that are on the U.S. EPA priority pollutant list. Groundwater quality as tested in samples collected from wells in the surficial landfill materials and in the becrock show that it is unlikely that groundwater has been significantly contaminated by landfill operations. No detectable levels of volatile organic

Prior to the start of the survey (both days) the meter was nulled (as per manufacturer's instruction) to assure consistency of all measurements. Battery power levels were checked throughout the survey to assure that readings were consistent. At each measurement station, coil alignment was carefully maintained, and field notes kept of any change in survey line orientation and the surrounding environment. Compass headings were maintained between each station to insure proper survey line locations.

Field measurements were transferred to large size maps provided by Bechtel. These data then were contoured (lines of equal conductivity) for both the 10 and 20 meter intercoil spacings. Figures 3 and 4 respectively show the interpreted contour lines from the survey. On both figures, only conductivity values 10 mmhos/meter or greater were contoured. Values less than 10 were considered to represent approximate "background readings".

2.2 Collection of Environmental Samples

Water samples were collected by WCC on 15 November 1981 from nine of the wells (Table 1) installed by Bechtel and a stream sample from Eighteen Mile Creek collected at the approximate location of the proposed railroad center line south of the area examined. Before collection of well samples, each of the wells selected for sampling was purged of water present in the well. Either utilizing an air drive pump or a bailer for those wells in which the pump could not fit, the amount of water excavated was about 10 gallons except for those wells which were pumped or bailed dry.

Sample containers for metal analyses and for volatile organic analyses were delivered (in locked ice chests which contained sufficient blue ice to maintain 4°C for a period of 24 hours) on the evening of November 14, 1981 by Advanced Environmental Systems, Inc. (AES). Chain-of-custody commenced upon delivery of sample containers. At the site, the ice chests were opened by WCC's Dr. Hirsch.

Reference 11
4/5

Table 2. ANALYTICAL RESULTS OF METAL ANALYSIS FOR THOSE EXCEEDING DETECTABLE CONCENTRATION (Expressed in mg/l or ppm).

Well Number	Arsenic[1]	Metal Barium[2]	Zinc[3]
D-51	< 0.010[4]	< 0.200	< 0.020
D-53	< 0.010	< 0.200	0.165
D-55	< 0.010	< 0.200	< 0.020
D-61	< 0.010	< 0.200	0.038
D-64	< 0.010	0.650	0.035
D-66	< 0.010	1.800	< 0.020
D-68	0.068	0.200	0.023
D-69	< 0.010	0.200	0.375
D-70	< 0.010	0.200	0.400
Str-1	< 0.010	0.200	0.035

[1]Primary drinking water standard 0.05 mg/l. Federal Register Aug. 27, 1980.

[2]Primary drinking water standard 1.0 mg/l. Federal Register Aug. 27, 1980.

[3]Organoleptic ambient water criteria 5.0 mg/l. Federal Register Nov. 29, 1980.

[4]Less than equals the detection limit.

The concentration of barium of 1.8 mg/l in Well D-66 exceeds the primary drinking water standard by 0.8 mg/l. Well D-66 is 20 feet northeast of Well D-68 which had no detectable concentration of barium.

Detectable concentrations of zinc were found in seven of the water samples (Table 1). Zinc concentrations ranged from 0.023 mg/l to 0.4 mg/l. All measured concentrations of zinc in the water samples was less than the organoleptic (taste and odor) ambient water criteria (Federal Register November 28, 1980) of 5 mg/l. There is no primary drinking water standard for zinc.

The greater zinc concentrations were found in Wells D-69 and D-70, located in the Norton Landfill, screened in the unconsolidated fill material. The zinc concentration found in Wells D-66 and D-68 were non-detectable and 0.023 mg/l, respectively. These two wells are located in the Norton Landfill, northwest of Wells D-69 and D-70, and are screened in the Grimsby and Power Glen Formations.

4.0 CONCLUSIONS

4.1 Existing Conditions

Groundwater occurs in the unconsolidated fill materials of the Norton and McGonigle Hilger Landfills and in bedrock below the landfills. Based on data of the conductivity survey, and the water levels in the landfill materials, groundwater within the Norton Landfill appears to be flowing northward toward Mill Street. Vertical percolation of groundwater from the landfill materials, in which the piezometric head is 20 feet greater than that of the underlying bedrock, is evidently slow. Preliminary data provided by the conductivity survey and water levels measured in wells, to date, indicate that the water in the landfill materials currently is effectively isolated from the groundwater within the bedrock.

REFERENCE 12

Reference 12
1/3

ANALYSIS OF
NINE GROUNDWATER SAMPLES

Report Prepared For

WOODWARD-CLYDE CONSULTANTS

by

ADVANCED ENVIRONMENTAL SYSTEMS, INC.

Prepared by:

June 1, 1982

AES - Report VM

Robert J. Brombos
Laboratory Director

Reference 1a
2/3

SCOPE OF WORK

Nine (9) groundwater samples have been analyzed for the following: arsenic, barium, cadmium, chromium, lead, zinc, total halogenated organics (THO), polychlorinated biphenyls (PCB's), methylene chloride, and oil and grease. The analyses were performed at the request of Dr. Al Hirsch of Woodward-Clyde Consultants.

SAMPLE COLLECTION AND CHAIN OF CUSTODY

Samples were collected by Mark Gallagher of Woodward-Clyde on April 27, 1982. The sample bottles were prepared and provided by AES. Chain of custody was immediately transferred to Mrs. Judy McDougall, Document Control Officer of AES.

METHODOLOGY

The analysis for metals was performed by graphite furnace AA in order to meet drinking water standards sensitivity. The procedures used for metals and oil and grease analysis are obtained in "Methods for the Chemical Analysis of Water and Wastes", U.S. EPA 600/4-79-020, March 1979.

THO was determined by extracting the sample with 15% methylene chloride/hexane. The extract was concentrated to 10 ml. and analyzed on a Varian 3700 Gas Chromatograph equipped with a halogen specific Hall detector (Tracor Model 560/700A). Areas under sample peaks were summed and compared to a Lindane standard curve.

Analysis for methylene chloride and PCB's was performed by Federal Register methods 601 and 608, respectively, Vol. 44, December 3, 1979.

RESULTS

Well #	Arsenic (mg/l)	Barium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Lead (mg/l)	Zinc (mg/l)	THO (µg/l)	Tot.PCB (µg/l)	Meth. Cl. (µg/l)	Oil & Grease (mg/l)
D-51	<0.010[1]	<0.200	<0.001	<0.005	<0.010	<0.050	<0.07	<0.50	<0.01	0.35
D-53	<0.010	<0.200	<0.001	<0.005	<0.010	0.130	<0.07	<0.50	<0.01	<0.05
D-55	<0.010	<0.200	<0.001	<0.005	<0.010	0.160	<0.07	<0.50	<0.01	0.93
D-61	0.010	<0.200	<0.001	<0.005	<0.010	<0.050	<0.07	<0.50	<0.01	1.51
D-64	0.010	<0.200	0.004	<0.005	<0.010	0.115	<0.07	<0.50	<0.01	0.37
D-66	0.014	<0.200	<0.001	<0.005	<0.010	<0.050	<0.07	<0.50	<0.01	0.38
D-68A	0.050	<0.200	0.005	0.008	0.066	<0.050	<0.07	<0.50	<0.01	0.75
D-69	0.014	<0.200	0.003	<0.005	<0.010	0.180	<0.07	<0.50	<0.01	0.08
D-70	<0.010	<0.200	<0.001	<0.005	<0.010	0.115	<0.07	<0.50	<0.01	3.17
Trip blank	<0.010	<0.200	<0.001	<0.005	<0.010	<0.050	**[2]	**[2]	<0.01	0.24
Field blank	<0.010	<0.200	<0.001	<0.005	0.010	<0.050	<0.07	<0.50	<0.01	0.48

[1] (<) Less than equals the limits of detection.

[2] No Sample

Reference 1 & 3/3

REFERENCE 13

Reference 15
1/2

WASTE CHARACTERIZATION
performed for
SOMERSET RAILROAD

Report Date: 11/9/82

PARAMETER	DRUM WASTE SAMPLE
Form	Liquid
Color	Green
Viscosity	Medium-high (mayonnaise-like)
Turbidity	Opaque
Solids	<5% suspended solids (extraneous material)
Odor	Cleaner/disinfectant-like (strong)
Layering	None observed
pH	8.78
Density @ 25°C	1.07 g/ml
% Total Solids @ 103°C	34.0%
Ash Weight @ 600°C	3.3% by weight
Flash Point (Pensky-Martens Closed Cup Tester)	>165°F
Heat of Combustion	3,270 BTU/lb 29,190 BTU/gal
Organically Bound Chlorine	0.26% by weight
Miscibility	Miscible with acetone, methanol, and water. Immiscible with toluene and hexane.
Burn Test	Does not readily ignite with an open flame; does not appear to be halogenated.
t-Ammonia	<1 mg/l
Cyanide Spot Test	Negative
t-Phenol	~175 mg/l
Reactivity with concentrated HCl at pH 1.83	Cloudy, white liquid (milk-like), no visible fumes or gases.
Reactivity with 50% NaOH at pH 12.58	Returned to green color, no visible fumes or gases.

COMMENTS: All analyses were performed in basic accordance with ASTM/EPA methodologies, where applicable. Ammonia and Phenol tests were performed using CHEMETRICS test kits.

FOR RECRA RESEARCH, INC. Brian C. Lembelder

DATE 11-9-82

RECRA RESEARCH, INC.

Reference 15
2/2

TABLE 1

ANALYTICAL RESULTS

SOMERSET RAILROAD
EP TOXICITY TEST EXTRACT

Report Date: 11/5/82
Date Received: 10/29/82

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION	EPA MAXIMUM CONCENTRATION (mg/l)
		DRUM WASTE EXTRACT	
Total Arsenic	mg/l	<0.005	5.0
Total Barium	mg/l	5.2	100.0
Total Cadmium	mg/l	<0.004	1.0
Hexavalent Chromium	mg/l	<0.004	5.0
Total Lead	mg/l	0.097	5.0
Total Mercury	mg/l	<0.002	0.2
Total Silver	mg/l	<0.001	1.0
Total Selenium	mg/l	<0.005	5.0

COMMENTS: The sample was subjected to the EP Toxicity Test procedure in accordance with protocol specified in the Title 40 Code of Federal Regulations, Part 261, Appendix II. Analyses of the resultant extract were performed according to methods presented in the EPA publication, Test Methods for Evaluating Solid Waste, 1980. Metals analyses were performed utilizing the method of standard addition. Hexavalent Chromium analysis was performed according to the method presented in the U.S. Federal Register of October 30, 1980. This determination was made using flame atomic absorption techniques. Values reported as "less than" (<) indicate the working detection limit for the particular sample or parameter.

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 11/5/82

RECRA ENVIRONMENTAL LABORATORIES
T. D. 483-1074/29-148

REFERENCE 14

Reference 1/3

RECEIVED NOV 1? LOCKPORT

SCA SERVICES
Model City Office

TO: Dick Shanley

FROM: Paul Letki PL

SUBJECT: Response to information requested by NYS E&G, Bechtel, Lane Construction and Woodward-Clyde

DATE: November 8, 1982

RECEIVED NOV 9 1982 LOCKPORT

Ref: NYS E&G 3074-A

Introduction: The Lane Construction Corporation requested SCA Chemical Services, Inc. at Model City (SCA/MC) to collect samples from a construction site in Lockport, NY on 8/27/82. The samples were collected, evaluated and approved for disposal at SCA/MC. The contaminated soil was excavated, transported and disposed of in a secure landfill at SCA/MC on 9/2/82.

Sampling: Mr. Richard Shanley, a Technical Sales Representative of SCA/MC, responded to a request from Lane Construction to assess a potential problem on 8/27/82. Mr. Shanley arrived at a construction site located on the south side of Mill St. in Lockport, NY on 8/27/82 at approximately 1:30 p.m. Mr. Wayne Sherman directed Mr. Shanley to a location where two leaking drums were found. A green, oily substance had leaked from the drums and contaminated the soil in the immediate vicinity. Mr. Shanley collected three contaminated soil samples in hexane rinsed glass bottles. Mr. Wayne Sherman witnessed the sampling. The samples were tagged and immediately transported back to SCA/MC's lab for evaluation.

Evaluation: Upon arrival at SCA/MC (4:00 p.m. on 8/27/82) the samples were immediately logged (1) in to initiate the evaluation/process in case mobilization for emergency response was determined. Below are the physical/chemical results of the collected samples.

Physical Appearance:	Opaque brown sludge/solid, oily
Viscosity:	High
Specific Gravity:	1.6
Odor:	Lysol like
Flammability:	Does not ignite
pH:	8-9 (aqueous)
Reactivity:	Does not react with water
Solids:	45.2%
Chemical:	6.5 mg/kg PCB as 1242, dry weight

All three samples were similar in the basic physical characteristics, therefore, a single composite was made for chemical analysis. Since the sample was not flammable, corrosive or water reactive, an emergency response was not deemed necessary. Due to their oily consistency, the samples were sent out to an independent testing lab for PCB analysis.

Footnote: (1) Initiation of the following internal documents
(a) Form SCA - Chem - 0002-1, 2 and 3
(b) Form SCA (Customer)

Attached please find:

Figure 1 - Chain of Custody
Figure 2 - Acts Testing Lab, Inc. Technical Report.
Note: Only the data under "Results: c) Sludge Sample" is pertinent to the samples collected for this project.
Figure 3 - Gas Chromatograph Conditions/Methodology
Figure 4 - Chromatographic Scans of Standard and Sample

The results of the testing were inconclusive as to the exact chemical component makeup of he contaminated soil samples. No hazard could be associated with the contaminated soil samples based on the testing performed.

Excavation: In response to Lane Construction's request to remove the contaminated soil, SCA mobilized and arrived at the construction site on 9/2/82. Mr. Ralph Love, (Special Project Supervisor, SCA/MC), supervised the operation. Approximately 15 cubic yards of material were removed including the empty drums above the contaminated zone.

Using a backhoe and front end loader, the contaminated soil was excavated and loaded onto a dump trailer lined with a piece of plastic.

Transportation/NYS RCRA Manifest: The dump trailer once filled proceeded to SCA/MC for disposal of the contaminated soil. Attached please find a copy of the State of New York, Hazardous Waste Manifest document no. NY 170408 7 (figure 5) completed and signed by Mr. G. Edwards of SRC.

The EPA Hazard Code and EPA waste type columns on the HWM were improperly filled out. The waste was not determined to be an EPA/NYS DEC RCRA hazardous material by the analytical tests performed at SCA/MC's lab. This material could have been shipped with only a Bill of Lading, without the HWM.

Disposal/Internal Manifesting: The truck with manifest document no. NY 170408 7 and W.O. # 76278 arrived at SCA/MC on 9/2/82. Attached please find a copy of the Shipping and Receiving Record (Figure 6) which documents the weight in. A copy of the Receiving Location Report (Figure 7) which documents the laboratory approval for disposal in Secure Landfill #10 Cell III and the landfill foreman's certification of disposal and exact grid location, H-7-II in SLF 10 III, is also attached.

PL/km
Enc.

FIGURE 2

Reference 17
3/3

ACTS TESTING LABS, INC.

3900 Broadway • Buffalo, N.Y. 14227-1192 • (716) 684-3300

TECHNICAL REPORT September 9, 1982

Mr. Paul Letki
SCA Chemical Services

OBJECT:

Analysis of two oil samples for lead, mercury, and PCB's. Analysis of two water samples and one soil sample for PCBs. The samples were received on September 1, 1982.

RESULTS:

A) Oil Samples

	August Fuel Type "C" Como. Oil	August Fuel Type "E" Como. Oil
Lead	LT 1.0	4.0
Mercury	LT 0.08	LT 0.08
PCB's	11.7	6,140

LT = Less Than

Metals are reported in parts per million (micrograms per gram).

PCB's are reported in parts per million as Aroclor 1260.

B) Water Samples

7-IV Como. - 10.2 milligrams per liter (mg/l) PCB's as Aroclor 1242.

7-Como. - 0.003 milligrams per liter (mg/l) PCB's as Aroclor 1260.

C) Sludge Sample - Comp. Lockport Clean-Up Sludge

After drying to constant weight the sample was found to contain 45.2% solids.

Dry Weight Basis - Sample contains 6.5 parts per million PCB's as Aroclor 1242.

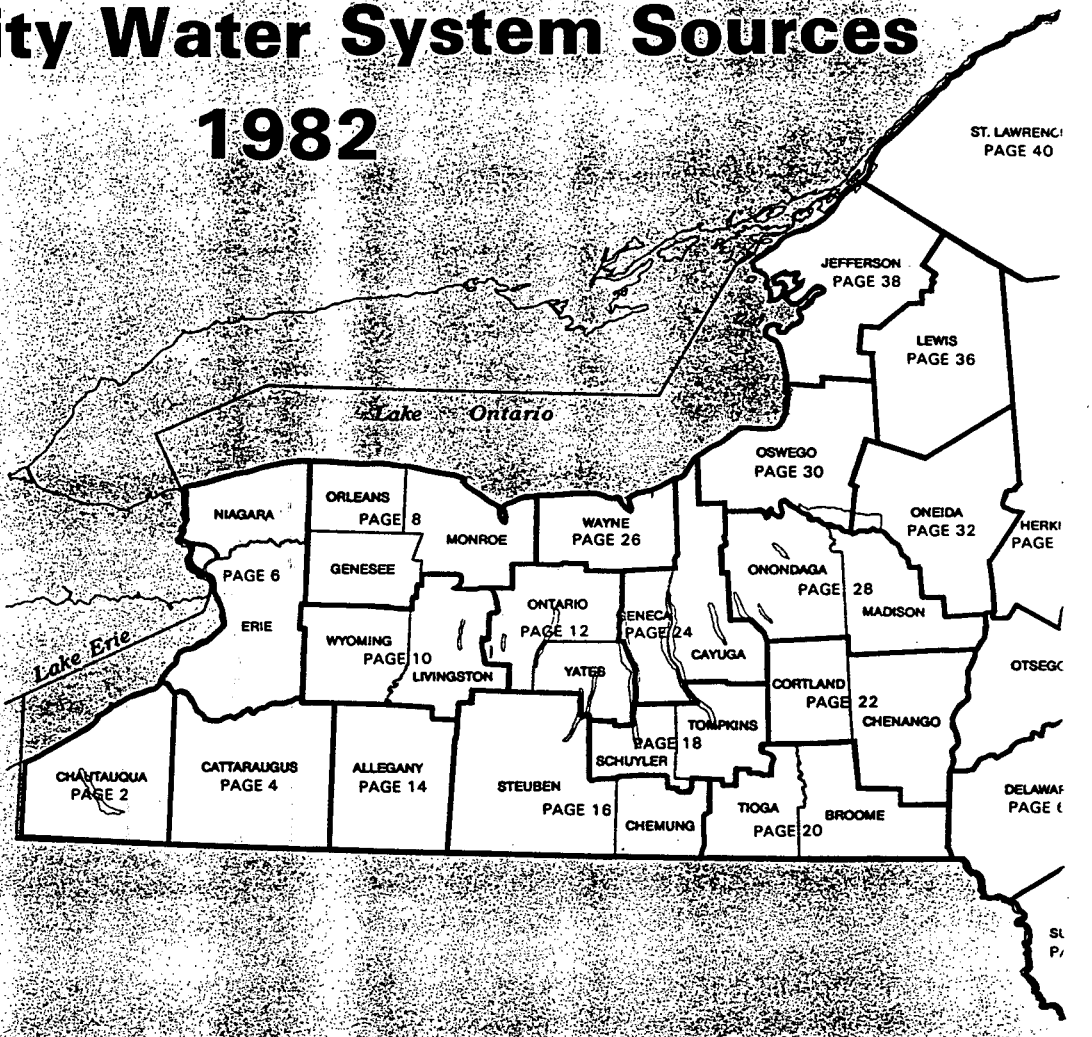
"As Received" Basis - Sample contains 2.9 parts per million PCB's as Aroclor 1242.

REFERENCE 15

Ref 15, 1/4

New York State Atlas of Community Water System Sources 1982

NEW YORK STATE
DEPARTMENT OF HEALTH



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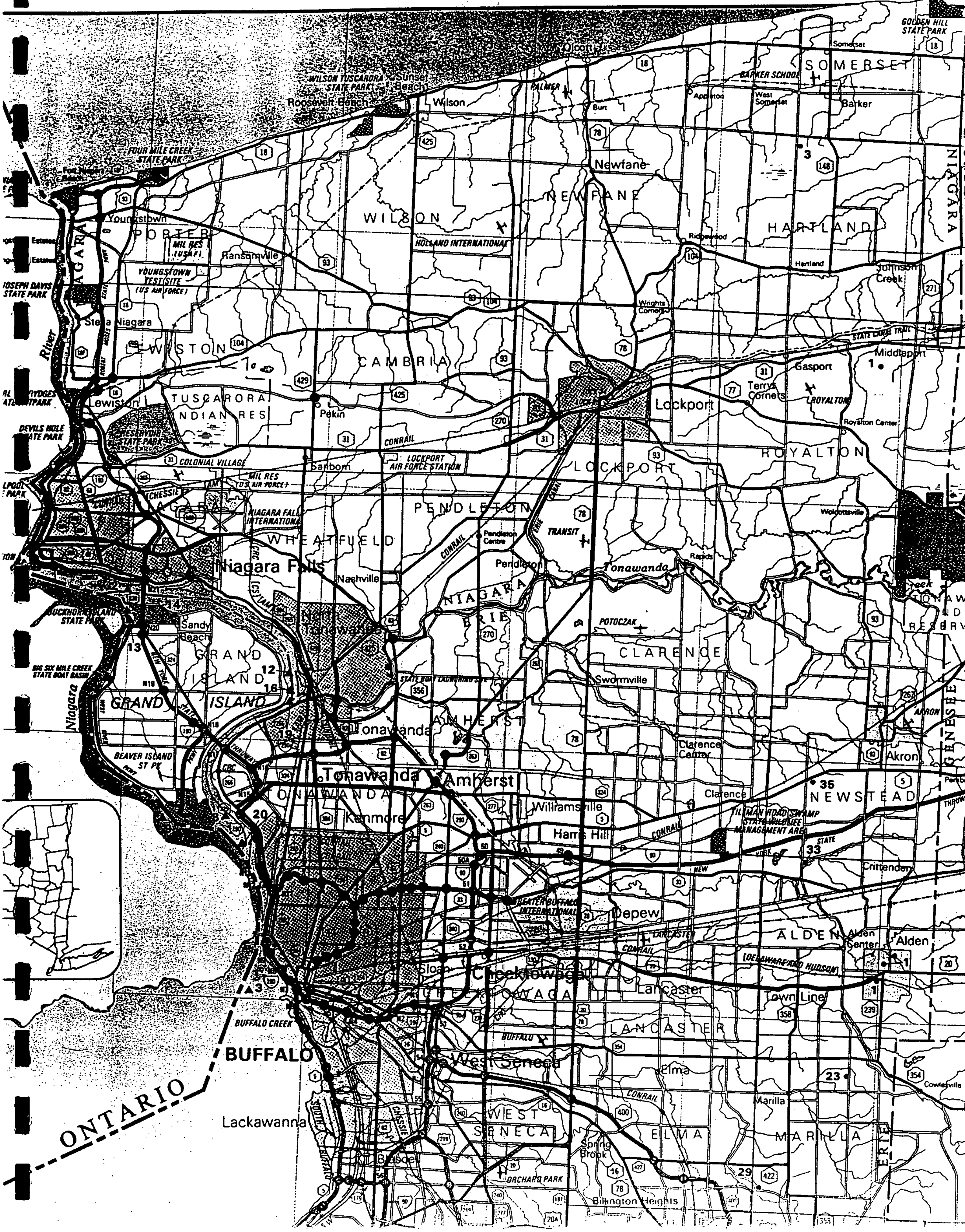
Ref. 15, 2/4



GOLDEN HILL STATE PARK
Somerset
SOMERSET
Olcott
WILSON TUSCARORA STATE PARK
Sunset Beach
BARKER SCHOOL
PALMER
Roosevelt Beach
Wilson
Burt
Appleton
West Somerset
Barker
FOUR MILE CREEK STATE PARK
Newfane
NEWFANE
NIAGARA
WILSON
Youngstown
PORTER
HOLLAND INTERNATIONAL
HARTLAND
Ridgewood
MIL RES (USAF)
Ransomville
YOUNGSTOWN TEST SITE (US AIR FORCE)
Hartland
Johnson Creek
JOSEPH DAVIS STATE PARK
Wrights Corners
Stella Niagara
STATE CANAL TRAIL
River
LEWISTON
CAMBRIA
Middleport
Gasport
Lewiston
TUSCARORA INDIAN RES
Terrys Corners
ROYALTON
Lockport
Pekin
Royalton Center
DEVILS HOLE STATE PARK
CONRAIL
ROYALTON
LOCKPORT AIR FORCE STATION
COLONIAL VILLAGE
Sanborn
LOCKPORT
MIL RES (US AIR FORCE)
CHESSIE
PENDLETON
ERIE CANAL
Wolcottsville
NIAGARA FALLS INTERNATIONAL
TRANSIT
WHEATFIELD
Pendleton Centre
Niagara Falls
Pendleton
Tonawanda
Nashville
Rapids
NIAGARA
ERIE
BUCKHORN ISLAND STATE PARK
POTOCZAK
North Tonawanda
TONAWANDA RESERV
Sandy Beach
CLARENCE
GRAND ISLAND
BIG SIX MILE CREEK STATE BOAT BASIN
Swormville
STATE BOAT LAUNCHING SITE
GRAND ISLAND
AMHERST
AKRON
Niagara
Tonawanda
Clarence Center
BEAVER ISLAND ST PK
Akron
Tonawanda
Amherst
TONAWANDA
Clarence
NEWSTEAD
Kenmore
Williamsville
TILLMAN ROAD SWAMP STATE WILDLIFE MANAGEMENT AREA
Harris Hill
NEW YORK STATE
Crittenden
GREATER BUFFALO INTERNATIONAL
Depew
LANCASTER
ALDEN
Alden Center
Alden
DELAWARE AND HUDSON
Sloan
Cheektowaga
CHEEKTOWAGA
Lancaster
Town Line
BUFFALO CREEK
LANCASTER
BUFFALO
BUFFALO
West Seneca
Elma
Cowlesville
CONRAIL
Marilla
ONTARIO
WEST SENECA
ELMA
MARILLA
Lackawanna
Spring Brook
Blasdell
ORCHARD PARK
Billington Heights
GENESEE
ERIE

Ref 15, 3/4

NIAGARA COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
Municipal Community			
	Lockport City (See No 12, Erie Co).	25000	
1	Middleport Village.	.2000. .	.Wells (Springs)
	Niagara County Water District (See No 13, Erie Co).	.48	
2	Niagara Falls City (See also No 14 Erie Co).	77384. .	.Niagara River - East Branch
	North Tonawanda City (See No 16 Erie Co).	36000	
Non-Municipal Community			
3	Country Estates Mobile Village. . . .	.28. .	.Wells

Ref 15, 4/4

ERIE COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
Municipal Community			
	Akron Village (See No 1 Wyoming Co, Page 10)	3640	
1	Alden Village	3460	Wells
2	Angola Village	8500	Lake Erie
3	Buffalo City Division of Water	357870	Lake Erie
4	Caffee Water Company	210	Wells
5	Collins Water District #3	704	Wells
6	Collins Water Districts #1 and #2	1384	Wells
7	Erie County Water Authority (Sturgeon Point Intake)	375000	Lake Erie
8	Erie County Water Authority (Van DeWater Intake)	NA	Niagara River - East Branch
9	Grand Island Water District #2	9390	Niagara River
10	Holland Water District	1670	Wells
11	Lawtons Water Company	138	Wells
12	Lockport City (Niagara Co)		Niagara River - East Branch
13	Niagara County Water District (Niagara Co)		Niagara River - West Branch
14	Niagara Falls City (Niagara Co)		Niagara River - West Branch
15	North Collins Village	1500	Wells
16	North Tonawanda City (Niagara Co)		Niagara River - West Branch
17	Orchard Park Village	3671	Pipe Creek Reservoir
18	Springville Village	4169	Wells
19	Tonawanda City	18538	Niagara River - East Branch
20	Tonawanda Water District #1	91269	Niagara River
21	Wanakah Water Company	10750	Lake Erie
Non-Municipal Community			
22	Aurora Mobile Park	125	Wells
23	Bush Gardens Mobile Home Park	270	Wells
24	Circle B Trailer Court	50	Wells
25	Circle Court Mobile Park	125	Wells
26	Creekside Mobile Home Park	120	Wells
27	Donnelly's Mobile Home Court	99	Wells
28	Gowanda State Hospital	NA	Clear Lake
29	Hillside Estates	160	Wells
30	Hunters Creek Mobile Home Park	150	Wells
31	Knox Apartments	NA	Wells
32	Maple Grove Trailer Court	72	Wells
33	Millgrove Mobile Park	100	Wells
34	Perkins Trailer Park	75	Wells
35	Quarry Hill Estates	400	Wells
36	Springville Mobile Park	114	Wells
37	Springwood Mobile Village	132	Wells
38	Taylors Grove Trailer Park	39	Wells
39	Valley View Mobile Court	42	Wells
40	Villager Apartments	NA	Wells

REFERENCE 16

FROST ASSOCIATES

Ref 16, 1/4

P.O.Box 495, Essex, Connecticut 06426
(203) 767-7644 FAX (203) 767-1971

Feb 8, 1995

To: Edgar Aguado
Ebasco Services Inc.
1290 Wall Street West
P.O Box 661
Lyndhurst, New Jersey 07071

Fr: Bob Frost
Frost Associates
P.O. Box 495
Essex, Conn 06426

Tel: (203) 767-1254
Fax: (203) 767-7069

Sub: Norton Labs
520Mill Street, Lockport, NY

CERCLIS: NYD030212799

Job: 50118

Site Longitude: 78-41-51 78.697502
Site Latitude : 43-11-11 43.186390

The CENTRACTS report below identifies the population, households, and private water wells of each Block Group that lies within, or partially within, the 4, 3, 2, 1, .5, and .25, mile "rings" of the latitude and longitude coordinates above. CENTRACTS may have up to ten radii of any length. 1000 block groups, and 15000 block group sides.

CENTRACTS uses the 1990 Block Group population and Block Group house count data found in the Census Bureau's 1990 STF-1A files. The sources of water supply data are from the Bureau's 1990 STF-3A files. The boundary line coordinates of the Block Groups were extracted from the Census Bureau's 1990 TIGER/Line Files.

CENTRACTS reports are created with programs written by Frost Associates, P.O. Box 495, Essex, Conn. The code was written using Microsoft's Quick-Basic Ver. 4.5.

Latitude and Longitude coordinates identifying a site are entered in degrees and decimal degrees. One or more county files holding Block Group boundary lines are selected for use by CENTRACTS by determining whether the site coordinates fall within the minimum and maximum Lat\Lon coordinates of each county in the state.

Each Block Group line segment has Lat\Lon coordinates representing the "From" and "To" ends of that line. All coordinates from the selected county files are read and converted from degrees, decimal degrees to X\Y miles from the site location. Each line segment is then examined whether it lies within or partially within the maximum ring from the site.

The unique Block Group ID numbers of each line segment that lie within the maximum ring are retained. All Block Group boundary lines matching the Block Group numbers are then extracted from the respective county files to obtain all sides of the included Block Groups. Boundary records are then sorted in adjacent side order to determine the shape and area of each Block Group polygon.

A method to solve for the area of a polygon is to take one-half the sum of the products obtained by multiplying each X-coordinate by the difference between the adja-

Norton Labs
[illegible]0 Mill St., Lockport, NY

cent Y-coordinates. For a polygon with coordinates at adjacent angles A, B, C, D, and [illegible] The formula can be expressed:

Area = 1/2{Xa(Ye-Yb)+ Xb(Ya-Yb)+ Xc(Yb-Yd)+ Xd(Yc-Ye)+ Xe(Yd-Ya)}

[illegible]r each ring, the selected Block Groups will be inside, outside, or intersected by [illegible]e ring. When a polygon is intersected, the partial Block Group area within that ring is calculated using the method described below.

[illegible]en a ring intersects a Block Group, the intersect points are solved and plotted at [illegible]e points where the ring enters and exits the shape. The chord line, a line within the circle connecting the intersect points is determined. This chord line is used to [illegible]lculate the segment area, the half moon shape between the chord line and the ring, [illegible]d the sub-polygon created by the chord line and the Block Group boundaries that lie outside the ring.

[illegible]e segment area is subtracted from the sub-polygon area to determine the area of the [illegible]b-polygon outside the ring. The area outside the ring is then subtracted from the area of the entire polygon to arrive at the inside area. This inside area is then divided by the tract's total area to determine the percentage of area within the [illegible]ng. This process is repeated for each block group that is intersected by one of the [illegible]ngs. The total area, partial area, and percentage of partial area of those block groups within, or partially within a ring, are held in memory for the report.

[illegible] occasion, the algorithm described above is unable to determine the area of the partial area. Within the report program is a "Paint" routine which allows an enclosed shape to be highlighted. Another routine calculates the percentage of highlighted [illegible]reen pixels to the pixels within the polygon. A manual entry is allowed. Both the [illegible]aint" method and manual entry method over ride the calculated method.

CENTRACTS lists, starting on page 4, all Block Groups in State, County, Census Tract, [illegible]d Block Group ID order that lie within, or partially within, the maximum ring. Each [illegible]ock Group is identified by a City or Town name and by the Block Group's State, County, Tract and Block Group ID number. Following is the Block Group's 1990 populu [illegible]ion and house count extracted from the Census Bureau's 1990 STF-1A files.

[illegible]he next four columns display water source data from the 1990 STF-3A files. The first column is "Units with Public system or private company source of water", followed by "[illegible]nits with individual well, Drilled, source of water"; "Units with individual well, [illegible]g, source of water" and "Units with Other source of water".

For each ring, CENTRACTS then shows the Block Groups that are within that ring, the [illegible]ock Group's total area in square miles, the partial area of the Block Group within [illegible]hat ring, and the partial percentage within the ring. The areas of the included Block Group and the partial areas are then totaled.

[illegible]he last section tallies the demographic data within each ring. The percentage of [illegible]rea for each Block Group is multiplied times the census data for that Block Group and totaled for all Block Group's within the ring. Ring totals are then determined [illegible]y subtracting the three mile data from the four mile, the two mile from the three [illegible]ile, one from the two, etc... Population on private wells is calculated using the [illegible]ormula: ((Drilled + Dug Wells) / Households) * Population

Ref 16, 3/4

Norton Labs
20 Mill St., Lockport, NY

========== Site Data ==========

Population:	37755.82
Households:	15014.85
Drilled Wells:	29.76
Dug Wells:	69.97
Other Water Sources:	9.09

========== Partial (RING) data ==========

---- Within Ring: 4 Mile(s) and 3 Mile(s) ----

Population:	5766.30
Households:	2100.03
Drilled Wells:	13.63
Dug Wells:	25.24
Other Wells:	1.78

** Population On Private Wells: 106.72

---- Within Ring: 3 Mile(s) and 2 Mile(s) ----

Population:	10695.18
Households:	3828.57
Drilled Wells:	7.53
Dug Wells:	22.03
Other Wells:	6.52

** Population On Private Wells: 82.58

---- Within Ring: 2 Mile(s) and 1 Mile(s) ----

Population:	16584.42
Households:	7181.33
Drilled Wells:	4.49
Dug Wells:	12.05
Other Wells:	0.78

** Population On Private Wells: 38.21

---- Within Ring: 1 Mile(s) and .5 Mile(s) ----

Population:	3882.09
Households:	1566.96
Drilled Wells:	1.68
Dug Wells:	4.19
Other Wells:	0.00

** Population On Private Wells: 14.53

Ref. 16, 4/4

Norton Labs
520 Mill St., Lockport, NY

--- Within Ring: .5 Mile(s) and .25 Mile(s) ----

Population:	657.67
Households:	266.64
Drilled Wells:	1.67
Dug Wells:	4.42
Other Wells:	0.00

* Population On Private Wells: 15.02

--- Within Ring: .25 Mile(s) and 0 Mile(s) ----

Population:	170.15
Households:	71.32
Drilled Wells:	0.76
Dug Wells:	2.04
Other Wells:	0.00

* Population On Private Wells: 6.68

** Total Population On Private Wells: 263.74

REFERENCE 17

Reference 17
1/1

11046/6-74

RECORD OF TELEPHONE CONVERSATION

DATE 2/14/94

TO File - Norton Labs/Dussault Foundry/Niagara Materials
NAME/FILE NO.

FROM L. Powell

CLIENT/PROJECT ARCS II HRS

SUBJECT flow rate - Eighteenmile Creek in Lockport

CHARGE: DEPT. NO. _____ CLIENT SYMBOL _____ OFS NO. _____

DISCUSSION WITH Paula Sattelberg @ Jackson St. Lockport Wastewater Treatment Plant

The facility ~~reports~~ states the flow rate in Eighteenmile Creek is 40 cfs at the location of plant output (target). The average output of the plant in 1994 was 13.63 mgd. This translates to 21.09 cfs.

COMMENTS

BY Leonard A. Powell
NAME

TITLE

DEPT. NO.

CC:

REFERENCE 18

Reference 10
1/1

11046/8-74

RECORD OF TELEPHONE CONVERSATION

DATE 2/1/95

TO File: Norton Labs/ Dussault Foundry/ Niagara Materials
NAME/FILE NO.

FROM Leonard Powell

CLIENT/PROJECT ARCS II

SUBJECT USEPA/ samples/ analytical data per Eighteenmile Creek, Lockport NY

CHARGE: DEPT. NO. _____ CLIENT SYMBOL _____ OFS NO. _____

DISCUSSION WITH Bernadette Anderson/ Simon Litton NYSDEC, Division of water
(518) 457-6674 (518) 457-5314

Called Ms. Anderson w/ questions per sampling of 18mile Creek. Referred/transferred to S. Litton who is head of research project on 18 mile Cr. Due to high levels of dioxins in fish flesh, DEC surveyed creek for PCB's & dioxins. According to Mr. Litton, the pipe under Lockport from the headwaters of that branch of 18mile Cr contributes to the flow very little. Treated sewage is discharged into the creek downstream of the canal. Water from Erie Canal is bled from canal to dilute sewage in creek. The 'Gulf' area is western branch. Harrison Radiator(?) plant releases treated water to this branch and the sewage Treatment plant releases also. There are indications that Mirex (flame retardant) is moving downstream from a factory upstream of the canal. A recent study near the mouth of 18mile creek will not be available till June 96. The report on the PCB/dioxin study is being sent to us.

~~COMMENTS~~ Mr Litton's comments per certain sites:

Norton Labs Site: area is bracketed by samples (upstream & downstream), VanDeMark chemicals has bad reputation but apparently area is OK regarding contaminat

Dussault Foundry - a sewage survey indicated a large increase in Mercury level downstream of Dussault compared to downstream.

Niagara Materials - Frontier Stone ~~not~~ discharges to Canal upstream of point where water taken from canal to dilute sewage. There is a possible increase in dioxin levels due to this discharge.

Mr. Litton will send us a copy of the dioxin report.

BY Leonard A Powell
NAME

_____ TITLE _____ DEPT. NO.

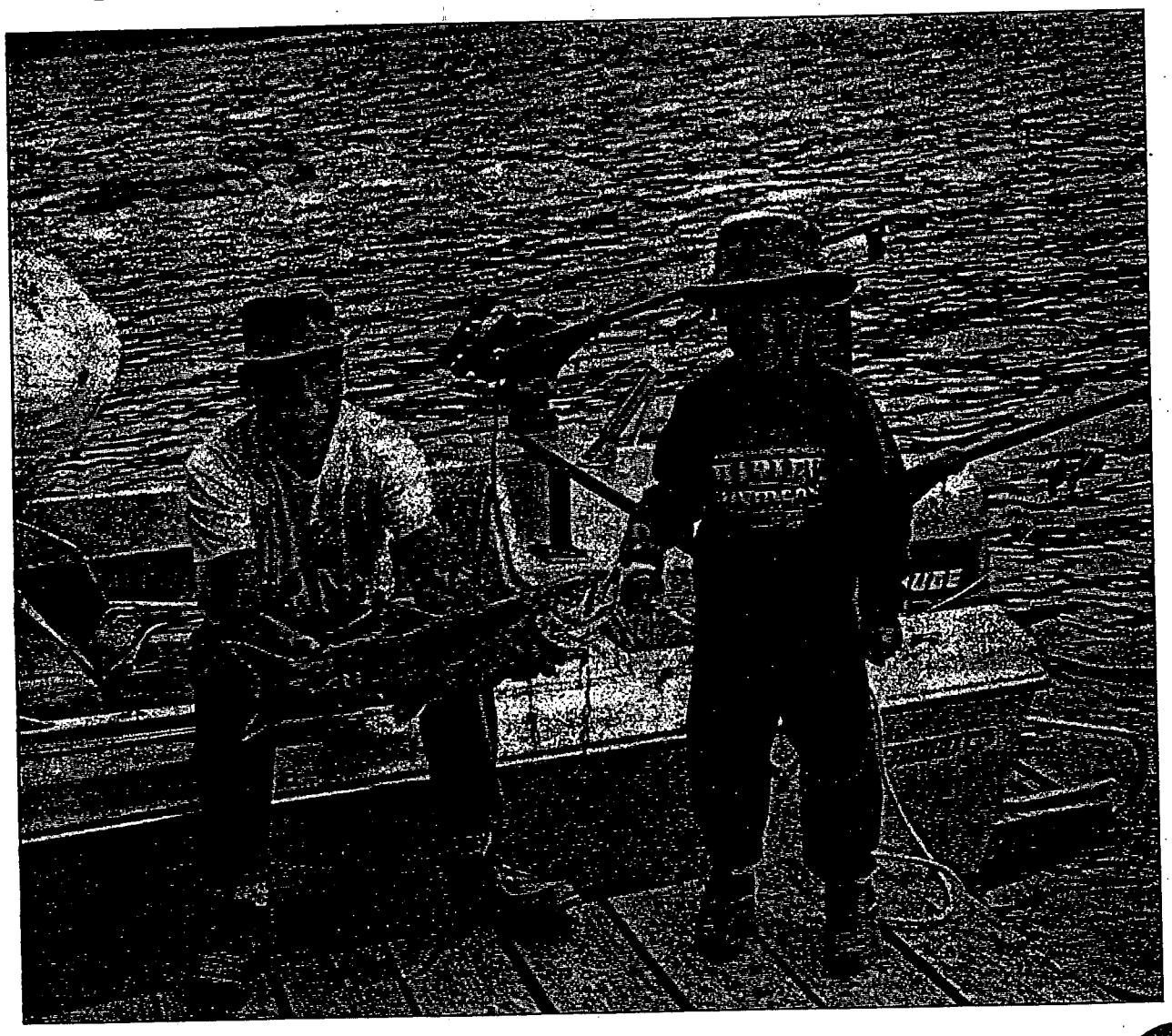
CC:

REFERENCE 19

Reference 17
1/2

New York

Fishing Regulations Guide 1994-95



New York State Department of Environmental Conservation

HEALTH ADVISORY

Reference 17
2/2

The following recommendations are based on evaluation of contaminant levels in fish and shellfish. To minimize potential adverse health impacts, the NYS Department of Health (DOH) recommends:

- Eat no more than one meal (½ pound) per week of fish from the state's freshwaters, Hudson River estuary, or New York City Harbor area including Upper and Lower Bays, Arthur Kill, Kill Van Kull, East River and Harlem River, except as recommended below.
- Women of childbearing age, infants and children under the age of 15 should not eat any fish species from the waters below.
- Follow trimming and cooking advice.
- Observe the following restrictions on eating fish from these waters and their tributaries to the first barrier impassable by fish.

Water (County)	Species	Recommended
Barge Canal Lockport to Niagara River (Erie; Niagara)	Carp	☐
Belmont Lake (Suffolk)	Carp	☐
*Big Moose Lake (Herkimer)	Yellow perch	☐
Buffalo River & Harbor (Erie)	Carp	•
Canadice Lake (Ontario)	Lake trout or brown trout over 21"	•
Canandaigua Lake (Ontario; Yates)	Lake trout over 24"	☐
Carry Falls Reservoir (St. Lawrence)	Walleye	☐
Cayuga Creek (Niagara)	All species	•
Delaware Park Lake (Erie)	Carp	☐
East River (New York City)	American eel	•
*Eighteen Mile Creek (Niagara)	All species	•
Ferris Lake (Hamilton)	Yellow perch over 12"	•
	Yellow perch under 12"	☐
Fourth Lake (Herkimer; Hamilton)	Lake trout	•
*Francis Lake (Lewis)	Yellow perch	☐
Gill Creek (Niagara) Mouth to Hyde Park Lake Dam	All species	•
Grasse River (St. Lawrence) Mouth to dam in Massena	All species	•
*Halfmoon Lake (Lewis)	Yellow perch	☐
Hall's Pond (Nassau)	Carp, goldfish	•
Harlem River (New York City)	American eel	•
Hoosic River (Rensselaer)	Brown trout, rainbow trout	☐
* Hudson River:		
Hudson Falls to Troy Dam	All species	No fishing
Troy Dam south to bridge at Catskill	All species except American shad	•
Bridge at Catskill south to and including the New York Harbor area	All species except American shad, blueback herring, bluegill, pumpkinseed and yellow perch	☐
	Blue crab:	Eat no more than 6 crabs per week
	hepatopancreas (mustard, liver or tomalley)	•
	cooking liquid	discard
Indian Lake (Lewis)	All species	☐
Irondequoit Bay (Monroe)	Carp	•
Keuka Lake (Yates; Steuben)	Lake trout over 25"	☐
Kinderhook Lake (Columbia)	American eel	☐
Koppers Pond (Chemung)	Carp	☐
Lake Champlain:		
Entire lake	Lake trout over 25", walleye over 19"	☐
Bay within Cumberland Head to Valcour Island	American eel, brown bullhead	☐
Lake Ontario and Niagara River		
below the falls	American eel, channel catfish, lake trout, chinook salmon, coho salmon over 21", rainbow trout over 25", brown trout over 20", carp	•
	Smaller coho salmon, rainbow and brown trout, white sucker	☐
West of Point Breeze	White perch	•
East of Point Breeze	White perch	☐
Loft's Pond (Nassau)	Carp, goldfish	☐
Long Pond (Lewis)	Splake over 12"	•
Upper Massapequa Reservoir (Nassau)	White perch	☐
Massena Power Canal (St. Lawrence)	Smallmouth bass	☐
Meacham Lake (Franklin)	Yellow perch over 12"	•
	Yellow perch 12" and under	☐
*Mohawk River between Oriskany and West Canada Creeks	Carp	•
*Moshier Reservoir (Herkimer)	Yellow perch	☐
Nassau Lake (Rensselaer)	All species	•
Niagara River above the falls	Carp	☐
Niagara River below the falls; also see Lake Ontario	White perch	•
	Smallmouth bass	☐
Onondaga Lake (Onondaga)	All species	•
Oswego River (Oswego) from power dam in Oswego to upper dam at Fulton	Channel catfish	☐
Round Pond (Hamilton)	Yellow perch over 12"	☐
St. James Pond (Suffolk)	All species	☐
St. Lawrence River		
Entire river	American eel, channel catfish, chinook salmon, carp, lake trout, coho salmon over 21", brown trout over 20", rainbow trout over 25"	•
	White perch, smaller coho salmon, rainbow and brown trout	☐
Bay at St. Lawrence-Franklin county line	All species	•
Salmon River (Oswego) Mouth to Salmon Reservoir; also see Lake Ontario	Smallmouth bass	•
Saw Mill River (Westchester)	American eel	☐
Schroon Lake (Warren)	Lake trout over 27"	☐
Sheldrake River (Westchester)	American eel	•
Skaneateles Creek Seneca River to dam at Skaneateles (Onondaga)	Brown trout over 10"	☐
Smith Pond at Roosevelt Park (Nassau)	American eel	•
	Carp, goldfish	☐
*Spring Pond (Suffolk)	Carp, goldfish	•
Stillwater Reservoir (Herkimer)	Splake	☐
*Sunday Lake (Herkimer)	Yellow perch	☐
Three Mile Creek (Oneida)	White sucker	☐
Valatie Kill (Rensselaer) between Co. Rt. 18 and Nassau Lake	All species	•
*Whitney Park Pond (Nassau)	Carp, goldfish	☐

• Eat none

☐ Eat no more than one meal per month.

* Changes from the 1993-94 Health Advisory

REFERENCE 20

Reference 20
1/3

olished.

determine if flood insurance is available in this community, act your insurance agent, or call the National Flood Insurance ram at (800) 638-6620, or (800) 424-8872.

APPROXIMATE SCALE

500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
LOCKPORT,
NEW YORK
NIAGARA COUNTY

PANEL 2 OF 3
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
360503 0002 B

EFFECTIVE DATE:
FEBRUARY 4, 1981

federal emergency management agency
federal insurance administration

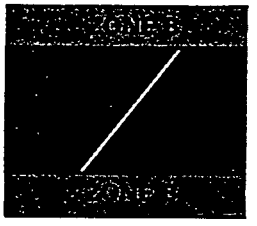
Reference 20
2/3

KEY TO MAP

500-Year Flood Boundary

00-Year Flood Boundary

one Designations* With Date of Identification e.g., 12/2/74



00-Year Flood Boundary

500-Year Flood Boundary

se Flood Elevation Line th Elevation In Feet** — 513

Base Flood Elevation in Feet here Uniform Within Zone** (EL 987)

Elevation Reference Mark RM7×

ver Mile • M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

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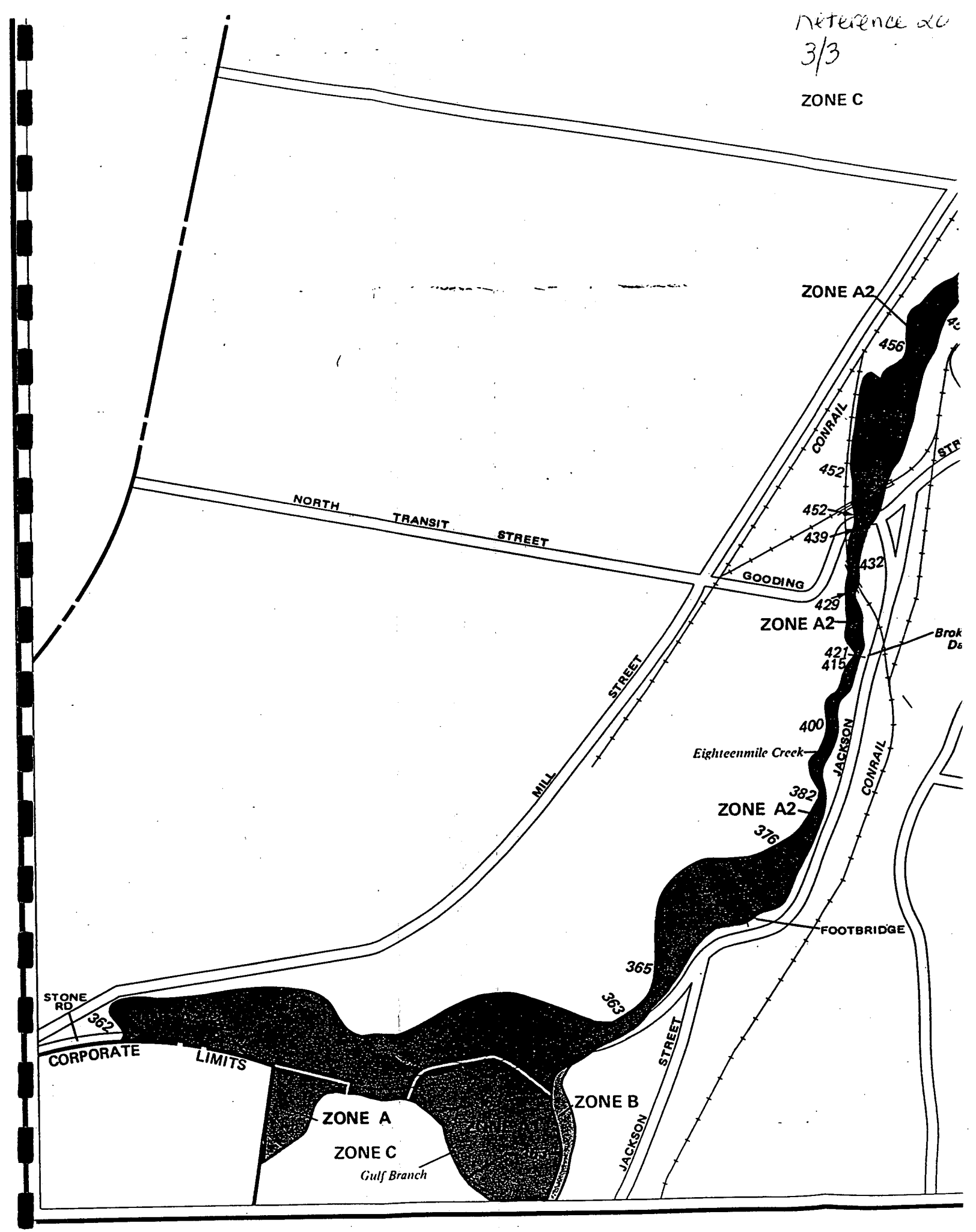


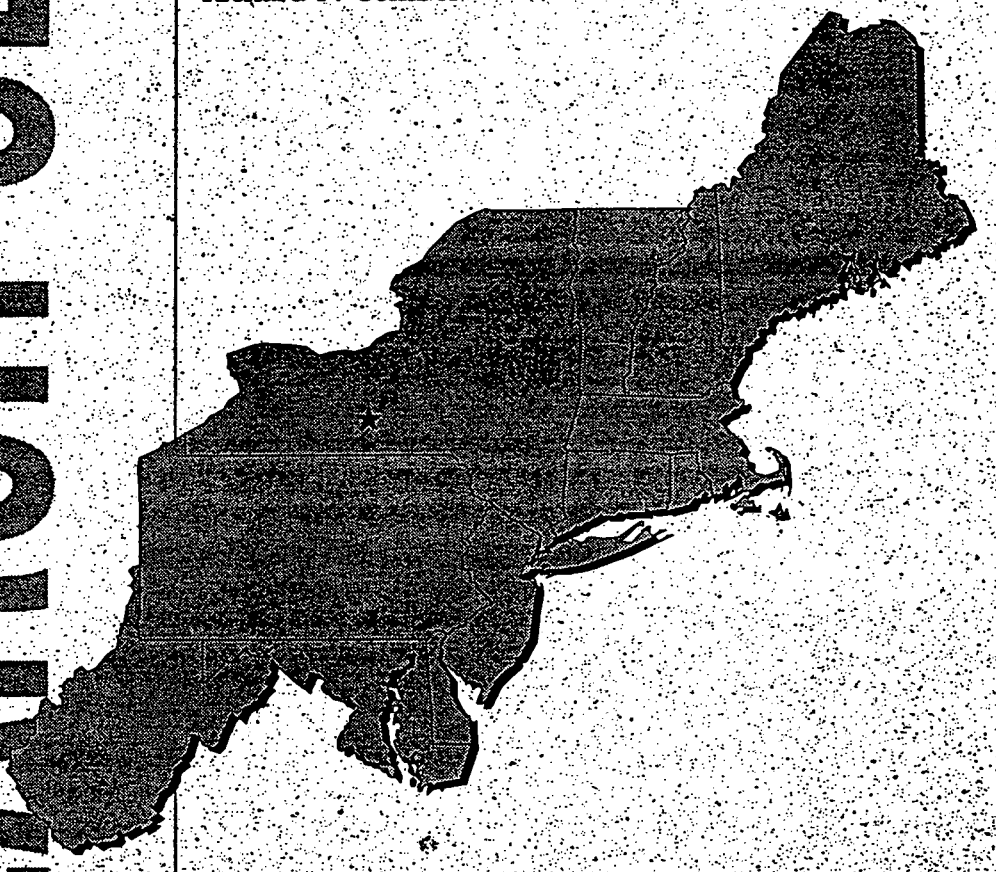
REFERENCE 21

RESEARCH REPORTS

NORTHEAST REGIONAL CLIMATE CENTER

Atlas of Precipitation Extremes for the Northeastern United States and Southeastern Canada

Daniel S. Wilks
Richard P. Cember



Cornell University
Ithaca, New York
Publication No. RR 93-5
September 1993

Reference 21
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Table 1. Empirical adjustment factors that can be used to transform precipitation amounts pertaining to calendar day observations, to estimates of maximum precipitation regardless of observation time. From Hershfield (1961).

To convert from precipitation over this many days	To maximum precipitation over this many hours	Multiply by
1	24	1.13
2	48	1.05
5	120	1.01
10	240	1.01

Table 2. Empirical adjustment factors that can be used to transform precipitation amounts pertaining to 24-hour accumulations to estimates of precipitation for shorter time periods. From Huff and Angel (1992).

To estimate maximum precipitation over	Multiply the precipitation amount from the 1-day maps by
18 hours	1.06
12 hours	0.98
6 hours	0.85
3 hours	0.72
2 hours	0.66
1 hour	0.53
30 minutes	0.42
15 minutes	0.31
10 minutes	0.24
5 minutes	0.14

observations were not constrained to occur at fixed times. Notice that these empirical conversion factors decrease quite sharply for the longer accumulation periods, indicating that a substantial fraction of the precipitation in the wettest 24 hours is expected on average to be distributed over a second daily observation, but that the 5- and 10-day periods are long enough that there is usually very little difference between calendar-day observations and arbitrarily located observation windows of the same lengths.

Similarly, many users will require estimates of extreme precipitation amounts occurring over periods shorter than 24 hours. While these can not be obtained directly from daily observations, they can be estimated using the empirical adjustment factors given in Table 2. These factors have been taken from Huff and Angel (1992), and correspond closely to those given in Hershfield (1961).

Example: Suppose the 100-year, 1-day precipitation for a location of interest, from Map 6, is 5.00 inches. The corresponding 100-year 24-hour precipitation (i.e., the estimated 24-hour, hundred-year precipitation regardless of the observation time) would be obtained by multiplying by the factor 1.13 from Table 1, yielding 5.00 x 1.13 = 5.65 inches. The estimated 100-year event for a 1-hour precipitation accumulation at this same location would be obtained, using Table 2, as 5.00 x 0.53 = 2.65 inches.

Finally, it should be realized that the maps in this atlas are likely to exhibit a bias in regions containing large topographic variations. This is because the places where the precipitation measurements have been made tend to be locations where people live and work, which are generally valley locations in preference to those at higher elevations. Cember and Wilks (1993) found that the existing station locations effectively underestimate average elevations in mountainous areas of the northeastern U.S. by about 500 feet.

Reference 21
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